

CCN-SIRs, their relative position in the quartile distributions of SIR_NEW and SIR_OLD remained the same. The discrepancies between SIR_NEW and SIR_OLD tended to be larger among CCNs with high SIRs.

Conclusion. The updated national pooled mean SIRs were close to 1.0, validating the potential use of new risk adjustment models and baseline as updated benchmarks for tracking CDI and MRSA prevention progress. The shifts in CCN-level SIRs between old and new baselines were not large, indicating a modest impact of new baselines at the CCN level, except among hospitals with high SIRs.

TABLE 1: Comparisons of the NHSN HAI standardized infection ratios (SIRs) between new and old baselines

	Metrics	CDI	MRSA
National pooled mean SIR			
NEW baseline (SIR_NEW)	HCN facility reporting, mean	3810, 0.997	3753, 1.013
OLD baseline (SIR_OLD)	HCN facility reporting, mean	3810, 0.931	3753, 0.962
Distribution of CCN-LEVEL SIR			
NEW baseline	HCN with SIR available, mean, median (IQR)	3047, 0.96 0.92 (0.60)	1710, 1.01 0.85 (0.91)
OLD baseline	HCN with SIR available, mean, median (IQR)	3298, 0.82 0.80 (0.62)	1845, 0.99 0.82 (0.95)
Comparison of overall distributions of CCN-LEVEL SIRs between OLD and NEW baseline			
	Kolmogorov-Smirnov test p-value	<0.0001	0.3487
Pairwise comparison of CCN-LEVEL SIRs among CCNs with available SIRs across OLD and NEW baseline			
		N=3041	N=1694
SIR Difference (SIR_NEW - SIR_OLD)	mean, median (IQR)	0.11, 0.07 (0.17)	0.005, 0.00 (0.21)
Test if median of pairwise differences is away from null	p-value by Sign test	<0.0001	0.1568
Change in significance level of CCN-level SIR from OLD to NEW baseline			
No change*	HCN (%)	2519 (83%)	1568 (93%)
Change into less favorable direction**	HCN (%)	424 (14%)	73 (4%)
Magnitude of shift in CCN-level SIR from OLD to NEW baseline			
Shift within the same quartile	HCN (%)	2215 (73%)	1267 (75%)
Shift up or below but within 1 quartile	HCN (%)	762 (25%)	218 (13%)

*CCN with "not different from national benchmark" (NS) in SIR_OLD remains NS in SIR_NEW; CCN with "worse than national benchmark" (WORSE) in SIR_OLD remains WORSE in SIR_NEW; CCN with "better than national benchmark" (BETTER) in SIR_OLD remains BETTER in SIR_NEW.
 **CCN with "not different from national benchmark" in SIR_OLD becomes "worse than national benchmark" in SIR_NEW; CCN with "better than national benchmark" in SIR_OLD becomes "WORSE than national benchmark" in SIR_NEW; CCN with "better than national benchmark" in SIR_OLD becomes "not different from national benchmark" in SIR_NEW.

Figure 1: Facility-onset laboratory-identified Clostridium difficile infection: (1-A) Comparison of overall distributions of CCN-level SIRs between new and old baseline, (1-B) Pairwise difference of CCN-level SIRs between new and old baseline, (1-C) Agreement plot that compares CCN-level SIRs between new and old baseline

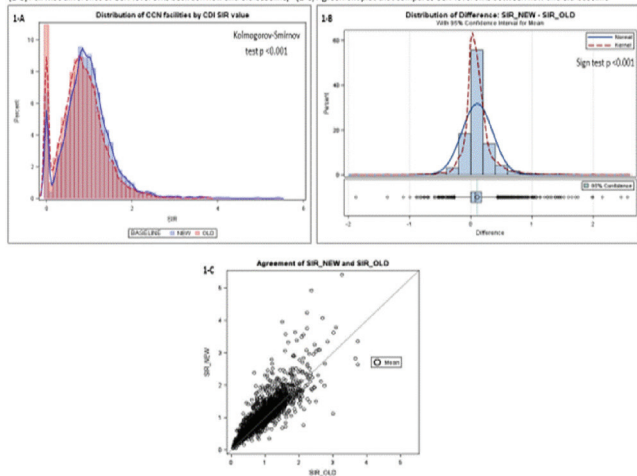
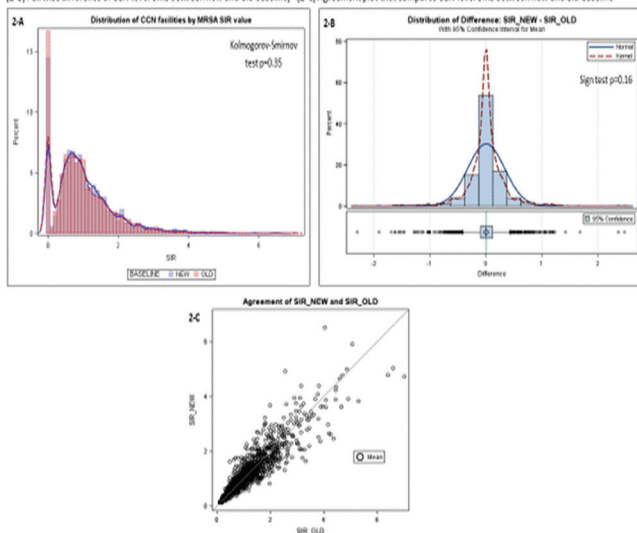


Figure 2: Facility-onset laboratory-identified MRSA bacteremia infection: (2-A) Comparison of overall distributions of CCN-level SIRs between new and old baseline, (2-B) Pairwise difference of CCN-level SIRs between new and old baseline, (2-C) Agreement plot that compares CCN-level SIRs between new and old baseline



Disclosures. All authors: No reported disclosures.

1770. Wide Range of Carbapenem-resistant Enterobacteriaceae Incidence and Trends in Emerging Infections Program Surveillance, 2012–2015

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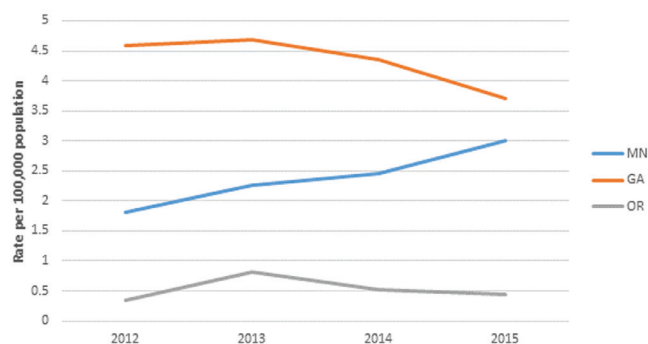
Background. Carbapenem-resistant Enterobacteriaceae (CRE) are an urgent threat in the United States because of high morbidity and mortality, few treatment options, and potential for rapid spread among patients. To assess for changes in CRE epidemiology and risk among populations, we analyzed CDC Emerging Infections Program (EIP) 2012–2015 surveillance data for CRE.

Methods. Active, population-based CRE surveillance was initiated in January 2012 at 3 EIP sites (GA, MN, OR) and expanded to 5 additional sites (CO, MD, NM, New York, TN) by 2014. An incident case was the first *Escherichia coli*, *Enterobacter*, or *Klebsiella* isolate (non-susceptible to at least one carbapenem and resistant to all third-generation cephalosporins tested) collected from urine or a normally sterile body site from a patient during a 30-day period. Data were collected from patients' medical records. Cases were hospital-onset (HO) or long-term care facility (LTCF) onset if patients were in the respective facility ≥3 days prior to culture or at the time of culture; and community-onset (CO) otherwise. We calculated incidence rates based on census data for EIP sites and described by type of infection onset.

Results. A total of 1,582 incident CRE cases were reported in 2012–2015. Most cases (88%) were identified through urine cultures; 946 (60%) were female, and median age was 66 years (interquartile range: 55–77). The median incidence by site was 2.95 per 100,000 population (range: 0.35–8.98). Among the three sites with four full years of data, a different trend was seen in each (Figure). Trends in GA and MN were statistically significant, and no significant trend was seen in OR. Overall, 480 cases (30%) were HO, 524 (33%) were LTCF onset, and 578 (37%) were CO. Of CO cases, 308 (53%) had been hospitalized, admitted to a long-term acute care hospital or were a LTCF resident in the prior year.

Conclusion. CRE incidence varied more than 20-fold across surveillance sites, with evidence of continued increases in MN. Measuring impact of programs aimed at reducing CRE transmission in other regions will require obtaining local data to identify cases occurring during and after healthcare facility discharge. Further study of changes in incidence in some settings and areas might offer opportunities to refine and expand effective control strategies.

CRE Incidence by EIP Site, 2012-2015



Disclosures. All authors: No reported disclosures.

1771. The Effect of National Healthcare Safety Network (NHSN) Rebaselining on Community Hospital SIRs

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Background. The NHSN recently updated risk adjustment models and “rebaselined” Standardized Infection Ratios (SIRs) for healthcare-associated infections. The CDC expected that hospital SIRs would generally increase. However, the impact of rebaselining on individual hospitals’ SIRs was unknown. Accordingly, we assessed the impact of rebaselining on SIRs in a network of community hospitals.

Methods. We analyzed 2016 SIR data for CAUTI, MRSA LabID events, CDI LabID events, colon SSIs (COLO), and abdominal hysterectomy SSIs (HYST) from 38 hospitals in the Duke Infection Control Outreach Network (DICON). SIRs calculated using the old and new baselines were compared. Wilcoxon signed rank test was performed to determine whether hospitals’ SIRs changed significantly following rebaselining. Hospitals were ranked by SIR for each metric, and change in rank following rebaselining was determined. Meaningful change in rank was defined as increase or decrease by ≥4 places (greater than a decile). Hospitals that did not have an SIR calculated for a given metric were excluded from that metric’s analysis.

Results. Median hospital SIRs for CAUTI and CDI increased significantly after rebaselining (0.587 vs 0.307, $P < 0.001$; and 0.825 vs 0.783, $p = 0.04$, respectively). Median MRSA SIRs increased (0.903 vs 0.797, $P = 0.5$), and COLO and HYST SIRs decreased (0.457 vs 0.586, $P = 0.1$; and 0 vs 0.489, $P = 0.4$); however, these changes were not statistically significant (Figure 1). For all metrics, a minority of hospitals had meaningful change in SIR rank following rebaselining (Figure 2).

Conclusion. SIRs increased following rebaselining for CAUTI and CDI but did not change significantly for MRSA, COLO, or HYST. The majority of hospitals’ SIR rank did not change meaningfully following rebaselining.

Figure 1. Box and whisker plots of 2016 SIRs before and after rebaselining. * P -value given by Wilcoxon signed rank test

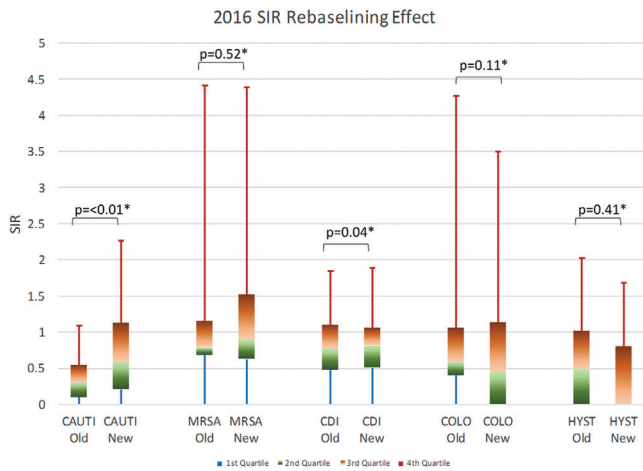
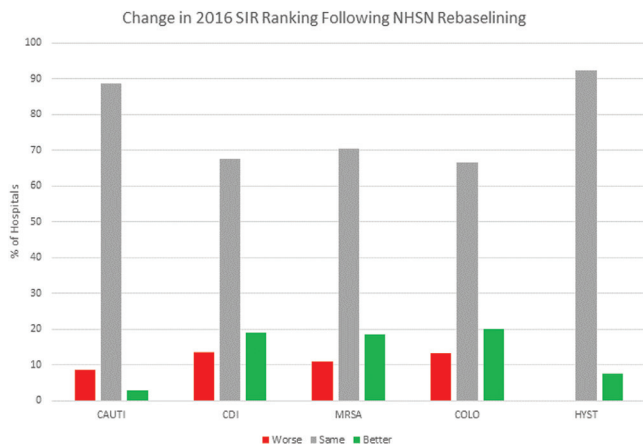


Figure 2. Change in 2016 SIR ranking following NHSN Rebasing among DICON hospitals.



Disclosures. D. Sexton, Centers for Disease Control and Prevention: Grant Investigator, Grant recipient; Centers for Disease Control and Prevention Foundation: Grant Investigator, Grant recipient; UpToDate: Collaborator, Royalty Recipient

1772. Uropathogens and Antibiotic Resistance Among Nursing Home Residents - National Healthcare Safety Network (NHSN)

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Background. Knowledge of urinary tract infection (UTI) pathogen and susceptibility patterns is necessary to inform antibiotic prescribing and monitor resistance. We describe bacterial pathogens and UTI antibiotic resistance patterns among residents in nursing homes (NHs) reporting to the National Healthcare Safety Network (NHSN) long-term care facility (LTCF) component.

Methods. All UTI events from January 1, 2013 to December 31, 2016 were included; up to three organisms per UTI event may be reported. Pathogen susceptibility results for selected antibiotics are reported as: Susceptible (S), Intermediate (I), Resistant (R), or Not tested (N). For this analysis, resistance was defined as I or R. We described pathogens and summarized antibiotic resistance only when ≥100 isolates of a bacterial species had susceptibility test results for a particular antibiotic reported to NHSN.

Results. In 166 NHs located in 37 states, a total of 4,054 pathogens were reported for 2,827 residents. Six organisms accounted for 81% of all UTI events ($n = 3,599$) (Table). A large proportion of *Escherichia coli* isolates, which accounted for 41% of uropathogens, were resistant to trimethoprim-sulfamethoxazole (35%) and levofloxacin (50%). Among *Proteus mirabilis* isolates, 53% were resistant to levofloxacin (Figure). Methicillin resistance was 74% among *Staphylococcus aureus*, and vancomycin resistance among *Enterococcus* spp. was 18%.

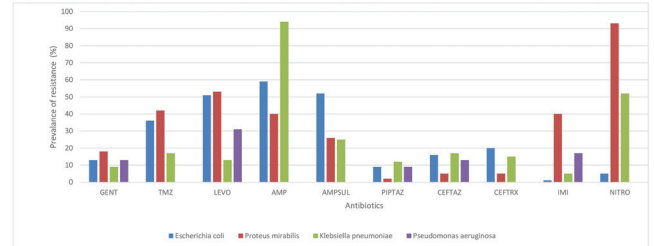
Conclusion. This is the first summary of UTI pathogens and susceptibility data from U.S. nursing homes reporting to a national surveillance system. Resistance to antibiotics commonly used to treat UTIs was high. Tracking and preventing resistance for key pathogens is a CDC priority and NHSN reporting by NHs provides a crucial opportunity to track antibiotic resistance, highlighting the importance of enrolling more NHs into NHSN.

Table: Top Nursing Home Uropathogens - NHSN, January 2013–December 2016

Pathogen	N	%
<i>Escherichia coli</i>	1,648	41
<i>Proteus mirabilis</i>	524	13
<i>Enterococcus</i> spp.	441	11
<i>Klebsiella pneumoniae</i>	412	10
<i>Pseudomonas aeruginosa</i>	256	6
<i>Staphylococcus aureus</i>	122	3

Note: *Enterococcus* spp. includes *E. faecium* and *E. faecalis*.

Figure. Antimicrobial resistance profiles of top gram negative bacteria for Nursing Home Uropathogens- NHSN, January 2013-December 2016



Note: GENT: gentamicin, TMZ: trimethoprim/sulfamethoxazole, LEVO: levofloxacin, AMP: ampicillin, AMPSUL: ampicillin/sulbactam, PIPFPAZ: piperacillin/azobactam, CEFTRAZ: ceftazidime, CEFTRX: ceftriaxone, IMI: imipenem, and NITRO: nitrofurantoin

Disclosures. All authors: No reported disclosures.

1773. Reductions in MRSA, Clostridium difficile and Intensive Care Unit (ICU) Acquired Bloodstream Infections and over 9 years from 276 United Kingdom ICUs

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Background. A major focus on preventing resistant organisms and hospital-acquired infections over the past 10 years has seen well-documented reductions in MRSA and *C. difficile* hospital and national level. Less is known about national changes in epidemiology of bloodstream infections, and such data is important to frame future national priorities and targets.

Methods. Data from the Intensive Care National Audit and Research Centre Program on MRSA, *C. difficile* and VRE colonization and ICU-acquired bloodstream infections (UABSIs) from 1,195,103 consecutive patients admitted to 276 UK ICUs (excluding Scotland) from 2007 to 2015 was analyzed.

Results. MRSA and *C. difficile* colonizations per 1000 patients decreased significantly (MRSA admissions 38.8 to 12.03 ($P = 0.00003$); MRSA acquisitions 25.4 to 3.1 ($P = 0.0008$);