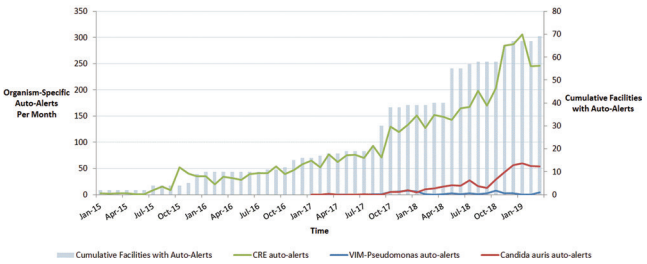
Figure. Illinois XDRO Registry Facility Auto-Alert On-Boarding and Alerts Per Month by XDRO type



Disclosures. **All Authors:** No reported Disclosures.

83. During A Million Patient-Days of Surveillance, Low Levels of Infection Prevention Staff Correlated with Higher Rates of Some Healthcare-Associated Infections

Emil P. Lesho, DO[1]; Robert Clifford, PhD[2]; Melissa Bronstein, MPA[1]; Carlos Sosa, BS[1] and Maryrose Laguio-Vila, MD[1]; [1]Rochester Regional Health, Webster, New York; [2]Cavia Partners, Brookville, Maryland

Session: 32. Surveillance in Healthcare-associated Infections
Thursday, October 3, 2019: 10:45 AM

Background. Reports regarding the correlations between infection preventionist (IP) staffing levels and healthcare-associated infections (HAI) are scarce, conflicting, and crucial for resource allocation and effort prioritization. We evaluated such correlations from January 1, 2012 to March 1, 2019 at a 528-bed teaching hospital in Rochester, NY; a period when IP staffing levels fluctuated between the recommended ratio of 1 IP: 80 patients and a critically low of 1 IP: >375.

Methods. Standardized National Health Safety Network (NHSN) definitions, along with laboratory events, re-admissions, interactions with surgical teams, and an independent data management company were used for case finding of catheter-associated urinary tract infection (CAUTI), *Clostridiodes difficile* (CDI), central line-associated bloodstream infection (CLABSI), carbapenem-resistant *Enterobacteria*ceae, and methicillin-resistant *Staphylococcus aureus* (MRSA). Colon, prosthetic knee and hip joint, hysterectomies, and coronary artery bypass graft surgical site infections (SSI) were also studied. Standardized infection ratios (SIR) were extracted from NHSN. Staffing levels were grouped into low (/ = 7 FTE). Correlations between HAI rates, SIR, and staffing levels were examined using Poisson and *T*-tests with the R statistical package.

Results. The average daily census of 451 resulted in 1.18 million total patient-days of surveillance. Periods of low and recommended IP levels occurred at similar seasons and for similar durations. There were fewer CDI, CAUTI, CLABSI, and MRSA infections when IP staff were at recommended levels than when IP staff were at the lowest level, but only CDI and CLABSI rates were significantly lower ($P = 0.003$ and 0.005, respectively). CLABSI SIR was 1.07 and 0.64 during periods of low and recommended staffing levels, respectively ($P = 0.004$). No significant differences occurred in SSI, either by type or by combined.

Conclusion. Hospitals often cannot achieve or maintain recommended IP staffing levels. Our findings suggest that, during critical personnel shortages, IP may have more impact by focusing on the types of HAI that correlated with preventionist staffing levels. This is among the largest such study to date, and uniquely includes the most types of HAI.

Disclosures. **All Authors:** No reported Disclosures.

84. Evaluation of the NHSN Standardized Infection Ratio (SIR) Risk Adjustment for HO-CDI in Oncology and ICU Patients in General Acute Care Hospitals

Christopher R. Polage, MD, MAS[1]; Kathleen A. Quan, MSN, RN, PHN, CIC, CPHQ, FAPIC[2]; Keith M. Madey, MAFIS-BBA[3]; Frank Meyers, MA, CIC, FAPIC[4]; Sneha Krishna, MSC[5]; Jonathan Grein, MD[5]; Laurel Gibbs, CLS/MT(ASCP), CIC[6]; Deborah S. Yokoe, MD, MPH[7]; Shannon C. Mabalot, MPH, CIC[8]; Raymond Chinn, MD[9]; Amy Hallmark, MS, CIC[10]; Zachary A. Rubin, MD[11]; Michael Fontenot[12]; Stuart Cohen, MD[12]; Debbra Wightman[4]; David Birnbaum, PhD, MPH[13]; Susan S. Huang, MD MPH[14] and Francesca J. Torriani, MD[15]; [1]Duke University Health System, Durham, North Carolina; [2]University of California, Irvine Health, Orange, California; [3]UC Irvine Health, Irvine, California; [4]UC San Diego Health, San Diego, California; [5]Cedars-Sinai Medical Center, Los Angeles, California; [6]UCSF Health, San Francisco, California; [7]University of California, San Francisco, San Francisco, California; [8]Sharp Memorial Hospital, San Diego, California; [9]Sharp Metropolitan Medical Campus, San Diego, California; [10]UCLA Health System, Los Angeles, California; [11]UCLA Medical Center, Los Angeles, California; [12]UC Davis Health System, Sacramento, California; [13]University of British Columbia, Sidney, BC, Canada; [14]University of California, Irvine, School of Medicine, Irvine, California; [15]University of California, San Diego, San Diego, California

Session: 32. Surveillance in Healthcare-associated Infections
Thursday, October 3, 2019: 11:00 AM

Background. The NHSN healthcare-facility onset *Clostridioides difficile* infection (CDI) standardized infection ratio (SIR) is used to compare hospital quality and set hospital reimbursement but inadequate risk adjustment could penalize hospitals unnecessarily. We hypothesized that general hospitals with large oncology and/or ICU populations were not fully adjusted in the 2015 NHSN acute care hospital CDI Laboratory-Identified (LabID) event prediction model and SIRs would be affected.

Methods. We validated a negative binomial regression HO-CDI event prediction model identical to the 2015 published model and used FY2016 data from eight general hospitals in California to test our hypothesis. We compared HO-CDI events and SIR values, with and without oncology/hematopoietic stem cell transplant or ICU unit events, patient-days, admissions, bed counts, and adjustment parameters included.

Results. Seven major teaching and one nonteaching general acute care hospitals were included (see Table). Eight had oncology/hematopoietic stem cell transplant units; seven had ≥43 ICU beds (median: 134; interquartile range [IQR]: 84–161). The median facility unmodified FacWideIn SIR was 1.23 [IQR: 1.15, 1.29]. Removal of oncology unit data resulted in a 15% median facility decrease in HO-CDI events (IQR: 14%, 21%) and −8% median facility decrease in SIR (IQR: −2%, −14%). Removal of ICU unit data resulted in a 22% median facility decrease in HO-CDI events (IQR: 16%, 26%) and 97% median facility increase in SIR at each facility (IQR: 78%, 105%).

Conclusion. The ICU bed adjustment in the 2015 NHSN SIR is a powerful correction that fully adjusted for ICU HO-CDI events at all hospitals in the study. However, the lack of risk adjustment for oncology/hematopoietic stem cell transplant unit HO-CDI events suggests that the current model unfairly penalizes general acute facilities, many of which also provide specialized oncologic care. Thus, the model needs to be re-adjusted to account for this important specialty care population in general acute care facilities.

Facility	CSMC	Sharp	UCD	UCI	UCLA RR	UCLA SM	UCSD	UCSF
Total HO-CDI events (observed)	298	68	112	138	141	70	213	232
ONC HO-CDI events (%)	29 (10%)	19 (23%)	15 (13%)	28 (20%)	20 (14%)	10 (14%)	35 (16%)	59 (25%)
ICU HO-CDI events (%)	63 (21%)	14 (17%)	29 (26%)	43 (31%)	50 (35%)	8 (11%)	60 (28%)	58 (25%)
Unmodified FacWideIn SIR	1.35	1.16	1.28	1.56	1.20	1.13	0.91	1.27
FWI SIR minus ONC (% change)	1.30 (-4%)	1.03 (-11%)	1.19 (-6%)	1.34 (-14%)	1.16 (-4%)	1.11 (-2%)	0.82 (-9%)	1.13 (-11%)
FWI SIR minus ICU (% change)	2.77 (+105%)	2.35 (+103%)	2.66 (+109%)	2.98 (+91%)	2.49 (+107%)	1.13 (0%)	1.71 (+88%)	1.87 (+47%)

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85. Use of Dual Statistical Process Control Charts for Early Detection of Surgical Site Infection Outbreaks at a Community Hospital Network

Arthur W. Baker, MD, MPH[1]; Nicole Nehls, BS[2]; Iulian Ilieş, PhD[2]; James C. Benneyan, PhD[2] and Deverick J. Anderson, MD, MPH[3]; [1]Duke University School of Medicine; Duke Center for Antimicrobial Stewardship and Infection Prevention, Durham, North Carolina; [2]Northeastern University, Boston, Massachusetts; [3]Duke Center for Antimicrobial Stewardship and Infection Prevention, Durham, North Carolina

Session: 32. Surveillance in Healthcare-associated Infections
Thursday, October 3, 2019: 11:15 AM

Background. We recently showed that the empirical use of a combination of 2 moving average (MA) statistical process control (SPC) charts was highly sensitive and specific for detecting potentially important increases in surgical site infection (SSI) rates. We performed this follow-up study to examine the performance of these same SPC charts when applied to known SSI outbreaks.

Methods. We retrospectively applied 2 MA SPC charts to all 30 SSI outbreaks investigated from 2007 to 2015 in a network of over 50 community hospitals. These outbreaks were detected via routine SSI surveillance activities that occurred in the network. We reviewed prior outbreak investigation documentation to determine the estimated time of outbreak onset and time of traditional surveillance outbreak detection. The first SPC chart utilized procedure-specific, composite SSI data from the hospital network for its baseline; the baseline for the second chart was calculated from SSI data from the outbreak hospital undergoing analysis. Both charts used rolling baseline windows but varied in baseline window size, rolling baseline lag, and MA window size. SPC chart outbreak detection occurred when either chart had a data point above the upper control limit of 1 standard deviation. Time of SPC detection was compared with both time of outbreak onset and time of traditional surveillance detection.

Results. With the dual chart approach, SPC detected all 30 outbreaks, including detection of 25 outbreaks (83%) prior to their estimated onset (Figure 1). SPC detection occurred a median of 16 months (interquartile range, 12–21 months) prior to the date of traditional outbreak detection, which never occurred prior to outbreak onset. Both individual SPC charts exhibited at least 90% sensitivity in outbreak detection, but the dual chart approach showed superior sensitivity and speed of detection (Figure 2).

Conclusion. A strategy that employed optimized, dual MA SPC charts retrospectively detected all SSI outbreaks that occurred over 9 years in a network of community hospitals. SPC outbreak detection occurred earlier than traditional surveillance detection. These optimized SPC charts merit prospective study to evaluate their ability to promote early detection of SSI clusters in real-world scenarios.