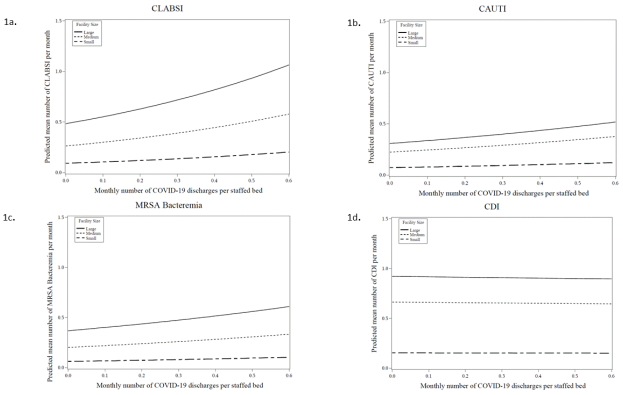
for all), with 60% (95% CI, 23 to 108%) more CLABSI, 43% (95% CI, 8 to 90%) more CAUTI, and 44% (95% CI, 10 to 88%) more cases of MRSA bacteremia than expected over 7 months based on predicted HAIs had there not been COVID-19 cases. *Clostridioides difficile* infection (CDI) was not significantly associated with COVID-19 burden. Microbiology data from 81 of the hospitals corroborated the findings. Notably, rates of hospital-onset bloodstream infections and multidrug resistant organisms, including MRSA, vancomycin-resistant enterococcus and Gram-negative organisms were each significantly associated with COVID-19 surges ($P < 0.05$ for all). Finally, clusters of hospital-onset pathogens increased as the COVID-19 burden increased ($P = 0.02$).

Limitations. Variations in surveillance and reporting may affect HAI data.

Table 1. Effect of an increase in number of COVID-19 discharges on HAIs and hospital-onset pathogens

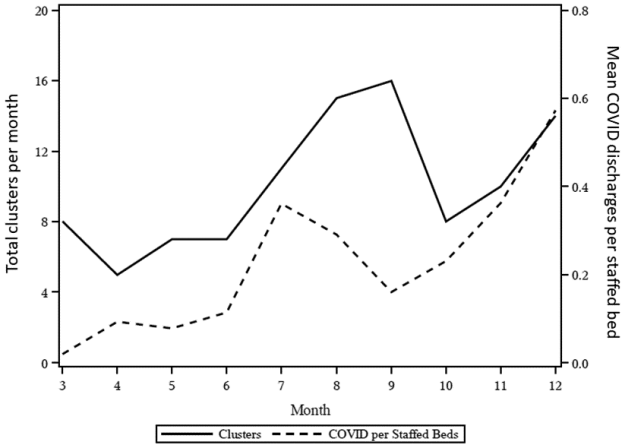
OUTCOME	EFFECT	RELATIVE RATE (95% CI)	P VALUE
CLABSI	Per 0.1 increase in the monthly number of COVID-19 discharges per staffed bed	1.14 (1.09, 1.19)	<0.001
	beds <200	Ref	-
	beds 200-299	2.14 (1.42, 3.23)	<0.001
	beds ≥300	2.43 (1.66, 3.56)	<0.001
CAUTI	Per 0.1 increase in the monthly number of COVID-19 discharges per staffed bed	1.09 (1.04, 1.15)	0.001
	beds <200	Ref	-
	beds 200-299	2.13 (1.39, 3.28)	0.001
	beds ≥300	1.91 (1.27, 2.87)	0.002
CDI	Per 0.1 increase in the monthly number of COVID-19 discharges per staffed bed	0.97 (0.93, 1.02)	0.247
	beds <200	Ref	-
	beds 200-299	3.37 (2.29, 4.96)	<0.001
	beds ≥300	3.17 (2.00, 5.01)	<0.001
MRSA BSI	Per 0.1 increase in the monthly number of COVID-19 discharges per staffed bed	1.09 (1.04, 1.14)	0.001
	beds <200	Ref	-
	beds 200-299	2.05 (1.28, 3.28)	0.003
	beds ≥300	2.18 (1.26, 3.76)	0.005
BSI	Per 0.1 increase in the monthly number of COVID-19 discharges per staffed bed	1.05 (1.03, 1.07)	<0.001
	beds <200	Ref	-
	beds 200-299	3.19 (2.37, 4.30)	<0.001
	beds ≥300	7.03 (5.29, 9.34)	<0.001
MDRO	Per 0.1 increase in the monthly number of COVID-19 discharges per staffed bed	1.05 (1.04, 1.07)	<0.001
	beds <200	Ref	-
	beds 200-299	3.01 (2.31, 3.93)	<0.001
	beds ≥300	5.44 (4.21, 7.03)	<0.001
MRSA	Per 0.1 increase in the monthly number of COVID-19 discharges per staffed bed	1.06 (1.04, 1.08)	<0.001
	beds <200	Ref	-
	beds 200-299	2.79 (2.02, 3.87)	<0.001
	beds ≥300	4.44 (3.25, 6.07)	<0.001
VRE	Per 0.1 increase in the monthly number of COVID-19 discharges per staffed bed	1.04 (1.01, 1.08)	0.016
	beds <200	Ref	-
	beds 200-299	2.88 (1.75, 4.75)	<0.001
	beds ≥300	5.05 (3.13, 8.13)	<0.001
GNR	Per 0.1 increase in the monthly number of COVID-19 discharges per staffed bed	1.06 (1.04, 1.08)	<0.001
	beds <200	Ref	-
	beds 200-299	3.16 (2.35, 4.26)	<0.001
	beds ≥300	6.29 (4.73, 8.37)	<0.001
Clusters	Per 0.1 increase in the monthly number of COVID-19 discharges per staffed bed	1.09 (1.01, 1.18)	0.02
	beds <200	Ref	-
	beds 200-299	1.55 (0.74, 3.27)	0/25
	beds ≥300	3.17 (1.63, 6.17)	<0.001

Figure 1. Predicted mean HAI rates as COVID-19 discharges increase



Predicted mean HAI rate by increasing monthly COVID-19 discharges. Panel a. CLABSI, Panel b, CAUTI Panel c. MRSA Bacteremia, Panel d. CDI. Data are stratified by small, medium and large hospitals.

Figure 2. Monthly comparison of COVID discharges to clusters



COVID-19 discharges and the number of clusters of hospital-onset pathogens are correlated throughout the pandemic.

Conclusion. COVID-19 surges adversely impact HAI rates and clusters of infections within hospitals, emphasizing the need for balancing COVID-related demands with routine hospital infection prevention.

Disclosures. **Kenneth Sands, MD, MPH**, **Medline** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic product) **Susan S. Huang, MD, MPH**, **Medline** (Other Financial or Material Support, Conducted studies in which participating hospitals and nursing homes received contributed antiseptic and cleaning products)**Molnlycke** (Other Financial or Material Support, Conducted studies in which participating hospitals and nursing homes received contributed antiseptic and cleaning products)**Stryker (Sage)** (Other Financial or Material Support, Conducted studies in which participating hospitals and nursing homes received contributed antiseptic and cleaning products)**Xttrium** (Other Financial or Material Support, Conducted studies in which participating hospitals and nursing homes received contributed antiseptic and cleaning products) **Ken Kleinman, PhD**, **Medline** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic products)**Molnlycke** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic products) **Edward Septimus, MD**, **Medline** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic products)**Molnlycke** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic products) **Eunice J. Blanchard, MSN RN**, **Medline** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic product) **Russell Poland, PhD**, **Medline** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic product) **Micaela H. Coady, MS**, **Medline** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic product)**Molnlycke** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic product) **Deborah S. Yokoe, MD, MPH**, Nothing to disclose **Julia Moody, MS**, **Medline** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic product)**Molnlycke** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic product) **Richard Platt, MD, MSc**, **Medline** (Research Grant or Support, Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic product)**Molnlycke** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic product) **Jonathan B. Perlin, MD, PhD**, **Medline** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic product)**Molnlycke** (Other Financial or Material Support, Conducted studies in which participating hospitals received contributed antiseptic product)

172. Impact of COVID-19 Pandemic on Healthcare-associated Infections (HAIs) in a Large Network of Hospitals

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Session: O-34. The Interplay Between COVID and other Infections

Background. The COVID-19 pandemic had a considerable impact on US healthcare systems, straining hospital resources, staff, and operations. Our objective was to evaluate the impact of COVID-19 pandemic on incidence and trends of healthcare-associated infections (HAIs) in a network of hospitals.

Methods. This was a retrospective review of central-line-associated bloodstream infections (CLABSIs), catheter-associated urinary tract infections (CAUTIs), C. difficile infections (CDI), and ventilator-associated events (VAE) in 51 hospitals from 2018 to 2021. Descriptive statistics were reported as mean hospital-level monthly incidence rates (IR) and compared using Poisson regression GEE models with period as the only covariate. Segmented regression (SR) analysis was performed to estimate changes in monthly IR of CAUTIs, CLABSIs and CDI in the baseline period (01/2018 – 02/2020) and the Pandemic period (03/2020 – 03/2021). SR model was not appropriate for VAE based on the plot. All models were constructed using SAS v.9.4 (SAS Institute, Cary NC).

Results. Compared to the baseline period, CLABSIs increased significantly by 50% from 0.6 to 0.9/ 1000 catheter days (P< 0. 001). In contrast, no significant changes were identified for CAUTI (P=0.87). Similar trends were seen in SR models for CLABSI and CAUTI (Figures 1, 2 and Table 1). While overall CDIs decreased significantly from 3.5 to 2.5/10,000 patient days in the pandemic period (P< 0.001), SR model showed increasing pandemic trend change (Figure 3). VAEs increased > 700% from 6.9 to 59.7/1000 ventilator days (P=0.15), but displayed considerable variation during the pandemic period (Figure 4). Compared to baseline period, there was a significant increase in central line days (647 vs 677, P=0.02), ventilator days (156 vs 215, P< 0.001), but no change in urinary catheter days (675 vs 686, P=0.32) during the pandemic period.

Figure 1: Segmented Regression model showing baseline and pandemic period trends of CLABSI

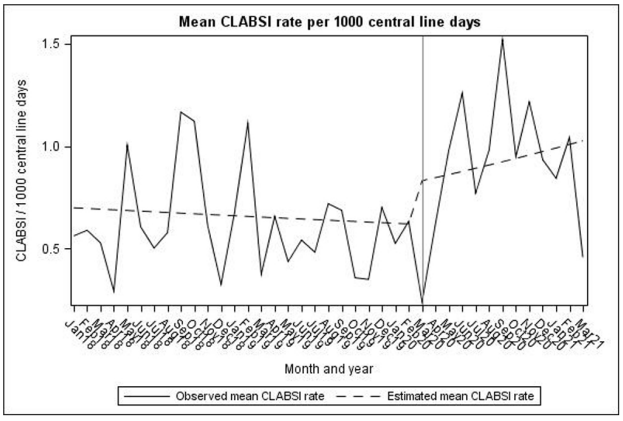


Figure 2: Segmented Regression model showing baseline and pandemic period trends of CAUTI

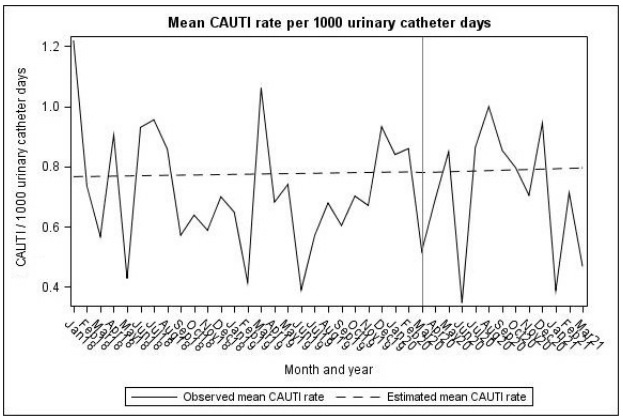
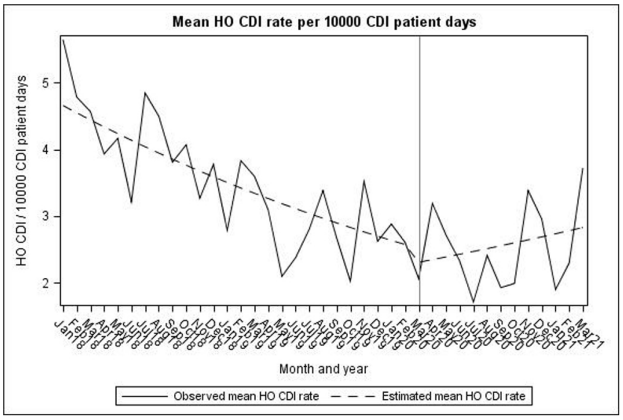


Figure 3: Segmented Regression model showing baseline and pandemic period trends of C. difficile (HO-CDI) infections



Conclusion. The COVID-19 pandemic was associated with substantial increases in CLABSIs and VAEs, no change in CAUTIs, and an increasing trend in CDI incidence. These variations in trends of different HAIs are likely due, in part, to unique characteristics of the underlying infection, resource shortages, staffing concerns, increased device use, changes in testing practices, and the limitations of surveillance definitions.

Figure 4: Trend of Ventilator-Associated Events (VAE) in the baseline and pandemic period (Segmented Regression model not appropriate)

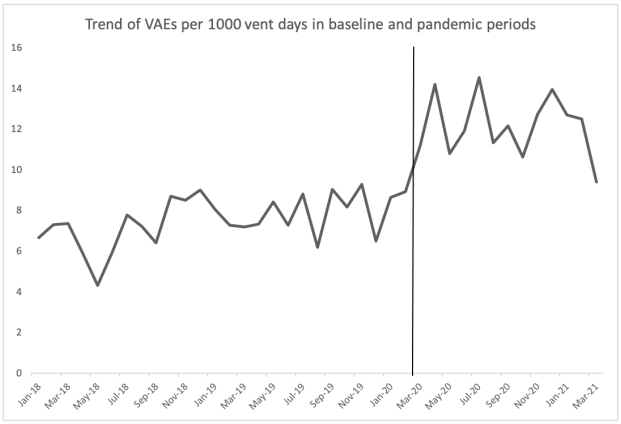


Table 1. Segmented Regression model results for CLABSI, CAUTI and CDIs in network hospitals

Variable	Baseline trend (RR; P value)	COVID-19 Pandemic level change (RR; P value)	COVID-19 Pandemic trend change (RR; P value)
CLABSI	0.995; 0.4026	1.348; 0.0159	1.023; 0.1477
CAUTI	1.001; 0.8907	0.996; 0.9745	1.001; 0.9593
CDI	0.977; <.0001	0.919; 0.265	1.042; 0.0012

CLABSI-Central line-associated bloodstream infections, CAUTI-catheter associated urinary tract infections, CDI- *C. difficile* infections, RR -Relative Risk

Disclosures. **Sonali D. Advani, MBBS, MPH**, Nothing to disclose **David J. Weber, MD, MPH**, Merck (Individual(s) Involved: Self): Consultant; PDI (Individual(s) Involved: Self): Consultant; Pfizer (Individual(s) Involved: Self): Consultant; Sanofi (Individual(s) Involved: Self): Consultant; UVinnovators (Individual(s) Involved: Self): Consultant

173. Deciphering COVID-19-Associated Effects on Hospital MRSA Transmission and Social Networks

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Session: O-34. The Interplay Between COVID and other Infections

Background. The COVID-19 pandemic was associated with a significant (28%) reduction of methicillin-resistant *Staphylococcus aureus* (MRSA) acquisition at UVA Hospital (*P*=0.016). This "natural experiment" allowed us to analyze 3 key mechanisms by which the pandemic may have influenced nosocomial transmission: 1) enhanced infection control measures (i.e., barrier precautions and hand hygiene), 2) patient-level risk factors, and 3) networks of healthcare personnel (HCP)-mediated contacts.

Figure 1. Monthly MRSA Acquisition Rates Pre- and Post-COVID-19