Table: Incidence and rate of blood pathogens in the pre and post SARS-CoV-2 period.

Blood Pathogen	Pre-SARS-CoV-2 (7/2019-2/2020; Total Admissions = 2,001,793)		During -SARS-CoV-2 (3/1/2020-5/19/2020)							
			SARS-CoV-2 Positive (Total Admissions = 125,303)		SARS-CoV-2 Negative (Total Admissions = 1,294,437)		SARS-CoV-2 Not Tested (Total Admissions = 1,455,483)		Total (Total Admissions = 2,875,219)	
	Organism N	Rate/1000 Adm	Organism N	Rate/1000 Adm	Organism N	Rate/1000 Adm	Organism N	Rate/1000 Adm	Organism N	Rate/1000 Adm
Gram-negative										
E. coli	17,748	8.9	359	2.9	6,156	4.8	2,599	1.8	9,114	3.2
K. pneumoniae	3,690	1.8	175	1.4	1,958	1.5	753	0.5	2,886	1.0
P. aeruginosa	1,364	0.7	94	0.8	833	0.6	343	0.2	1,270	0.4
P. mirabilis	1,590	0.8	75	0.6	771	0.6	275	0.2	1,121	0.4
E. cloacae	753	0.4	45	0.4	419	0.3	185	0.1	649	0.2
B. fragilis	357	0.2	26	0.2	378	0.3	152	0.1	556	0.2
S. marcescens	406	0.2	44	0.4	287	0.2	120	0.1	451	0.2
K. oxytoca	343	0.2	14	0.1	233	0.2	90	0.1	337	0.1
E. aerogenes	273	0.1	37	0.3	155	0.1	64	< 0.1	256	0.1
A. baumannii spp.	353	0.2	21	0.2	159	0.1	60	< 0.1	240	0.1
M. morganii	255	0.1	12	0.1	134	0.1	55	< 0.1	201	0.1
S. maltophilia	180	0.1	9	0.1	66	0.1	38	< 0.1	113	< 0.1
C. freundii	102	0.1	4	< 0.1	71	0.1	30	< 0.1	105	< 0.1
P. stuartii	63	< 0.1	10	0.1	59	< 0.1	16	< 0.1	85	< 0.1
Gram-positive										
S. aureus	12,797	6.4	636	5.1	6,050	4.7	2,642	1.8	9,328	3.2
Enterococcus	1,508	0.8	308	2.5	1,812	1.4	725	0.5	2,845	1.0
Grp B Strep	1,524	0.8	110	0.9	1,739	1.3	603	0.4	2,452	0.9
S. pneumoniae	1,703	0.9	70	0.6	659	0.5	372	0.3	1,101	0.4
Grp A Strep	849	0.4	47	0.4	631	0.5	305	0.2	983	0.3
Fungus/Yeast										
Non-C. albicans	1,259	0.6	250	2.0	1,033	0.8	470	0.3	1,753	0.6
C. albicans	762	0.4	251	2.0	660	0.5	293	0.2	1,204	0.4
Other - Candida	37	< 0.1	7	0.1	4	< 0.1	6	< 0.1	17	< 0.1

Gray indicates significantly lower rate compared to pre-pandemic time period, black indicates significantly higher rates compared to pre-pandemic.

Methods: This was a multi-center, retrospective cohort analysis of all hospitalized patients from 267 US acute care facilities with >1-day inpatient admission between 7/1/19-5/19/21 (BD Insights Research Database [Becton, Dickinson and Company, Franklin Lakes, NJ]). SARS-CoV-2 infection was identified by a positive PCR during or ≤7 days prior to hospitalization. All admissions with a non-contaminant culture positive GN, GP, and fungal/yeast pathogen from a blood source were evaluated prior to and during the SARS-CoV-2 pandemic as rates per 1,000 admissions ($p < .05$ for significance).

Results. There were 2,001,793 admissions in the pre-SARS-CoV-2 period (7/2019-2/2020) and 2,875,219 admissions during the SARS-CoV-2 pandemic. Incidence of GN/GP blood stream pathogens was significantly higher prior to the SARS-CoV-2 pandemic than during the pandemic. Higher rates of blood stream pathogens occurred in those who were tested for SARS-CoV-2, but all non-tested patients had significantly lower rates than pre-pandemic. Rates of *Candida spp.*, Enterococcus spp., *Serratia marcescens*, and *Enterobacter cloacae* were higher in SARS-CoV-2 positive patients compared to pre-pandemic patients. Compared to the prior pandemic period, the incidence of *B. fragilis*, *Streptococcus*, Enterococcus and *Candida* were higher among those tested for SARS-CoV-2 but were negative.

Conclusion. In general, rates of positive blood cultures for bacterial pathogens were either lower or similar during the SARS-CoV-2 period compared to the pre-SARS-CoV-2 pandemic period. The patients that were tested for SARS-CoV-2 but were positive who had higher rates of infection than prior may indicate the similarity in viral and bacterial clinical presentation. Further evaluation of higher rates of Enterococcus and Candida in the pandemic period are warranted.

Disclosures. **Laura A. Puzniak, PhD**, **Merck & Co., Inc.** (Employee) **Karri A. Bauer, PharmD**, **Merck & Co., Inc.** (Employee, Shareholder) **Kalvin Yu, MD**, **BD** (Employee) **Pamela Moise, PharmD**, **Merck** (Employee) **Vikas Gupta, PharmD, BCPS**, **Becton, Dickinson and Company** (Employee, Shareholder)

222. Clinical and Microbiological Characteristics of Common Bacterial Bloodstream Infections in the US Military Health System

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Session: P-10. Bacteremia

Background. Bloodstream infections (BSI) are associated with inpatient morbidity in the United States. We sought to characterize the epidemiology of common bacterial BSIs in individuals receiving care within the US Military Health System (MHS), which actively prospectively captures clinical and microbiological data from both retired and active-duty US Uniformed Service members and their beneficiaries.

Methods. We performed a retrospective cohort study analyzing MHS patients with blood cultures positive for all bacterial pathogens, between January 2010 and December 2019. Microbiological data captured by the Navy and Marine Corpse Public Health Center, excluding cultures isolating contaminants, were retrospectively collated with clinical and demographic data from the MHS Data Repository.

Results. The most frequent nine bacterial pathogens, as well as *Acinetobacter* spp. represented 17,206 episodes of BSI from 14,531 individuals. The cohort was predominantly male (59.4%) and ≥65 years old (48.7%). Most individuals were retired (N=5,249) or active duty (N=1,418) service members and their dependents (N=5,236). Median Updated Charlson Comorbidity Index Score was 2. Chronic pulmonary disease was the most frequent comorbid condition. Hospital admission was associated with 13,733 (79.8%) BSI episodes, including 5,870 admissions to the ICU. Overall, inpatient mortality was 8.3%. *E. coli* (29.7%, N= 5,114) was isolated with the highest frequency, followed by *S. aureus* (22.4%, N=3,853). Further, 9.5% of *E. coli* and 36.9% of *S. aureus* isolates were resistant to ceftriaxone and oxacillin, respectively. Beta-hemolytic streptococci represented the highest percentage (6.3%) of recurrent BSI episodes occurring at least 14 days post-initial BSI. Males or Native American race were most commonly infected with *S. aureus*. *E. coli* BSI was most common in all other demographic categories.

Frequency of Bacterial Blood Stream Infections in the US Military Health System

Bacterial Species	Frequency of All BSI Episodes	Total Patients with BSI Episodes	Patients with Multiple BSI Episodes, ≥14 days after initial BSI (% of Total Patients)
Escherichia coli	5,114	4,866	217 (4.5)
Staphylococcus aureus	3,853	3,581	218 (6.1)
Klebsiella pneumoniae	1,680	1,561	97 (6.2)
Streptococcus Beta-Hemolytic Group	1,356	1,253	79 (6.3)
Streptococcus species	1,193	1,168	23 (2.0)
Streptococcus Viridans Group	1,177	1,160	15 (1.3)
Enterococcus faecalis	1,059	991	60 (6.1)
Streptococcus pneumoniae	770	753	15 (2.0)
Pseudomonas aeruginosa	740	705	30 (4.3)
Acinetobacter species	264	253	6 (2.4)
Total	17,206	14,531*	730*

* not mutually exclusive

The most frequent nine bacterial pathogens, as well as Acinetobacter spp. in the US Military Health System.

Conclusion. We assessed the epidemiologic features of all individuals with BSI receiving care in the MHS over a 10-year period. We noted demographic differences in the occurrence of microbiological causes of BSI including *S. aureus*. Further assessments are underway into BSI-related risk factors for occurrence, antimicrobial resistance and mortality, after controlling for comorbidities and disease severity.

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223. The Value of Neutrophil to Lymphocyte Count Ratio for Predicting the Clinical Outcomes of Patients with Carbapenem-resistant *Klebsiella pneumonia* Blood Stream Infection

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Session: P-10. Bacteremia

Background. The neutrophil to lymphocyte count ratio (NLR) has been recognized as a useful marker of inflammation. But, the prognostic function of NLR in patients with Carbapenem-resistant *Klebsiella pneumonia* (CRKP) blood stream infection is still largely unknown. The aim of this study was to explore the relationship between postoperative NLR and mortality in those patients.

Methods. We performed a retrospective study based on the database from Computerized Patient Record System in Sir Run Run Shaw Hospital from 1/1/2017 to 31/10/2020. Logistic analysis was performed to assess the associations between NLR and 28-day mortality. Multivariate analyses were used to control for confounders.

Results. A total of 134 CRKP blood stream infection inpatients were included in this study, including 54 fatal cases and 80 survival cases on the 28-day after the onset of CRKP BSI, the overall 28-day mortality rate of patients with a CRKP BSI episode was 40.3% (54/134). We conducted a multivariate analysis on these 134 patients and found that APACHE II score on the 4th day (OR 1.379 95% CI 1.065- 1.785, $p = 0.015$), NLR on the 4th day (OR 1.134 95% CI 1.054- 1.221, $p = 0.001$) were significant risk factors for the 28-day mortality of CRKP BSI patients

Conclusion. Elevated NLR was significantly associated with increased 28-day mortality as well as APACHE II score on the 4th day after first positive culture.NLR is promising to be a readily available and independent prognostic biomarker for patients with CRKP blood stream infection.

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224. Evaluating the Epidemiology of Bloodstream Infections: A Population-Based Study

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Session: P-10. Bacteremia

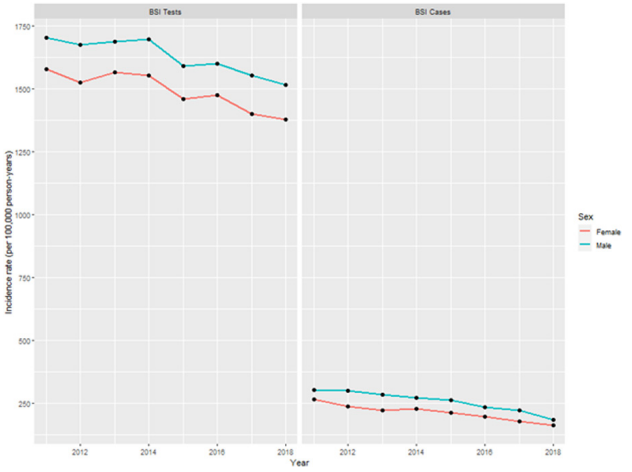
Background. Bloodstream infections (BSI) are a major cause of morbidity, mortality, and health care costs worldwide. Population-based studies are key to assess BSI

epidemiology over time while minimizing selection bias but remain limited. Therefore, we aimed to assess the incidence of BSI in a large Canadian health region in a contemporary period. We hypothesized that there would be significant age and sex-based differences including over time.

Methods. We conducted a retrospective cohort study from 2011 through 2018 using a population-based microbiology database to determine the annual age- and sex-specific BSI testing and case rates with the census as the population reference. BSI was defined as a positive blood culture for a pathogen. Episodes > 30 days apart were included for analysis. Incidence rate ratios (IRR) for testing and case rates including by sex were calculated to assess changes over time. All analyses were run at a two-sided α of 0.05 and were conducted with R 4.0.4.

Results. A total of 154,147 distinct individuals (49.9% male) were analyzed and 22,869 (14.8%) had a BSI at the first encounter in the study period. Overall BSI testing incidence ranged from 1529 to 1707 per 100,000 person-years and case incidence ranged from 180 to 292 per 100,000 person-years. Testing and case incidence for BSI was greatest in the 0-4 and 75+ years age groups ($p < 0.01$). Males compared to females had greater testing and case incidence rates in young and old age groups, but females had greater rates in the 15-44 years groups ($p < 0.01$). Overall IRR for cases comparing 2018 to 2011 was 0.62 (95% CI 0.59-0.65) reflecting a significant decrease over time. Testing also decreased over the study period with an IRR of 0.90 (95% CI 0.88-0.91). Testing and case IRRs were not significantly different stratified by sex.

Incidence rates (per 100,000 person-years) of BSI testing and cases by sex from 2011 through 2018 in a Canadian health region



Conclusion. In our large population-based study of BSI, we identified that BSI remain frequent and the youngest and oldest age groups as well as males in these age groups have the greatest BSI incidence rates which may reflect both biological sex and gender-based differences. Encouragingly, BSI incidence rates have decreased over time at a greater increment relative to testing rates. Future studies of BSI should focus on pathogen and outcome-based evaluations.

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225. Risk Factors for Mortality in Stenotrophomonas Bacteremia: A Retrospective Study

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Session: P-10. Bacteremia

Background. Stenotrophomonas is a gram-negative organism typically associated with nosocomial infections. It is an emerging multi-drug resistant pathogen associated with significant morbidity and mortality in hospitalized patients. Optimal therapy is unknown. In this study, we evaluated the impact of treatment agent, dosing regimen, and patient characteristics on 30-day mortality for Stenotrophomonas bacteremia in our hospital system.

Category	Alive at 30 days (n = 48)	Died at 30 days (n = 21)	p-value
Female gender, n (%)	25 (52.1%)	6 (28.6%)	0.07
Age, median (interquartile range)	55 (37.25-70.75)	59 (52-66)	0.3
Hematologic malignancy, n (%)	10 (20.8%)	7 (33.3%)	0.27
Solid organ transplant, n (%)	11 (22.9%)	6 (28.6%)	0.62
Pitt bacteremia score, median (interquartile range)	0 (0,0)	1 (0-4)	<0.01
No antibiotics used within 30 days of culture, n (%)	15 (31.3%)	1 (4.8%)	0.03
Central line associated bloodstream infection, n (%)	41 (85.4%)	14 (66.7%)	0.08
Length of stay, median (interquartile range)	13.5 (5.75-49.75)	40 (30-89)	<0.01

Table 1. Clinical characteristics of patients alive vs dead at 30 days after positive blood culture for stenotrophomonas

Methods. Retrospective chart review from April 2013 to September 2019 at Ronald Reagan and Santa Monica UCLA Medical Centers in Los Angeles, California. Adult patients who were hospitalized and received active therapy for Stenotrophomonas bacteremia were included in the study. Chi-square or Fischer test was used for categorical variables, Student's t-test or Mann-Whitney U test was used for continuous variables.

Results. Sixty-nine patients were included in the study. The median age was 53 and 31 patients (44.9%) were female. Central line associated infections were the most common source of infection (79.7%, n = 55). Two patients (3%) had a relapse of infection. The overall 30-day mortality was 30.4% (n=21). The patients who did not survive to 30 days tended to have a higher Pitt bacteremia score, a longer length of stay, and were more likely to have used other antibiotics in the 30 days prior to culture collection. Trimethoprim-sulfamethoxazole (TMP-SMX) was the most common antibiotic used for treatment (n = 45, 65.2%). Of the patients who were treated with TMP-SMX, 19 were treated with high-dose (defined as 15 mg/kg or equivalent) and 26 had an alternative dosage after adjusting for renal function. There was no difference in 30-day mortality in the TMP-SMX high dose vs alternative dose (42.1% vs 30.8%, p = 0.53).

Conclusion. Stenotrophomonas bacteremia was associated with high mortality. High-dose TMP-SMX did not impact survival in our study; however, this may be due to small sample size. More research is needed to determine optimal therapy.

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226. Multidrug Resistant Polymicrobial Gram-negative Bacteremia in Hematologic Cancer Patients with Febrile Neutropenia at the Uganda Cancer Institute

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Session: P-10. Bacteremia

Background. Bloodstream infections (BSI) are associated with significant mortality in hematologic cancer patients with febrile neutropenia. Poor clinical outcomes are associated with presence of multidrug resistant (MDR) organisms and polymicrobial infections. We sought to determine antimicrobial resistance and outcomes of polymicrobial bloodstream infections in hematologic cancer patients with febrile neutropenic episodes (FNEs) at the Uganda Cancer Institute.