

Introduction

- A central line is an intravenous catheter that is placed into a vein and terminates near the heart.
- A CLABSI occurs when bacteria or fungi enter the patient's central line and then enters into their bloodstream.
- CLABSIs can be prevented by practicing proper insertion and maintenance techniques.
- Up to one in every four patients with a CLABSI die.
- 37 of 50 United States are required by law to report hospital acquired infections (HAIs), including CLABSIs, to National Healthcare Network System (NHSN)
- From 2018 to 2019 there was a national decrease in CLABSI by 7%
- NYS CLABSIs showed a 24% improvement comparing 2018 rates to 2015

Objectives

Comparing pre-pandemic CLABSI data with post pandemic data will reveal if the improvement efforts have been sustained despite the pandemic or if more focused efforts are needed to combat the impact on HAIs post pandemic in NYS.

Methods

- Dataset was used from the NYSDOH Hospital Acquired Infection Report
- The pre-pandemic period was defined as the calendar year of 2019.
- The post pandemic period was defined as July to December of 2020.
 - CMS suspended HAI reporting requirement for the first 2 quarters of 2020 amid the COVID-19 pandemic.
- The pandemic period will be defined as January 2020 to June 2020.
- *Statistical approach:* A 2 tailed z-test of proportion was conducted for the pre and post pandemic period infection rates.

Results

The analysis compared New York State (NYS) data pre and post the COVID-19 pandemic. NYS data shows that all reportable hospital acquired infection rates have declined between 2015 to 2019. When comparing the pre-pandemic rates to the post pandemic rates, there was an increase in medical, surgical and medical surgical ward central line associated bloodstream infections. There was a decrease in colon, hysterectomy and fusion surgical site infections, coronary, surgical, pediatric and neonatal intensive care units. There was no change in hip replacement surgical site infections and medical intensive care unit central line associated bloodstream infections.

The comparison of pre and post pandemic CLABSI infection rates is displayed in Table 1. There was statistical significance for an increase in CLABSIs in NYS medical wards from a rate per 1000 central line days of 0.78 pre-pandemic to 1.00 in the post pandemic period ($P = .02263$). Medical and surgical ICUs did not experience a significant change in CLABSI. For the medical ICU there was no change from 0.91 to 0.91 and for the surgical ICUs a decrease from 1.03 to 0.88. The medical surgical and surgical wards both had an increase in CLABSI rates that were not statistically significant however may have clinical significance. The medical surgical rate increased from 0.61 to 0.67 and the surgical rate increased from 0.72 to 0.76. The pediatric ICUs, neonatal ICUs and pediatric wards in NYS all showed a decrease in CLABSIs from the pre-pandemic period to the post pandemic period. The pediatric ICU rate decreased from 1.24 to 1.14, the neonatal ICU rate decreased from 1.31 to 1.18 and the pediatric ward rate decreased from 1.28 to 0.90.

TABLE & FIGURE 1

TABLE 1: NYS CLABSIs	Pre-Pandemic (CY 2019)	Post Pandemic (July 2020 to December 2020)	Associated z-test	p-value
CLABSI per 1000 central line days				
CLABSI- Medical ICU	0.91	0.91	0.01	0.9889
CLABSI- Surgical ICU	1.03	0.88	0.7	0.4506
CLABSI- Pediatric ICU	1.24	1.14	0.3	0.7667
CLABSI- Neonatal ICU	1.31	1.18	0.1	0.9452
CLABSI- Medical Wards	0.78	1.00	2.3	0.02263*
CLABSI- Medical Surgical Wards	0.61	0.67	0.6	0.5196
CLABSI- Surgical Wards	0.72	0.76	0.3	0.7829
CLABSI- Pediatric Wards	1.28	0.90	1.2	0.2278

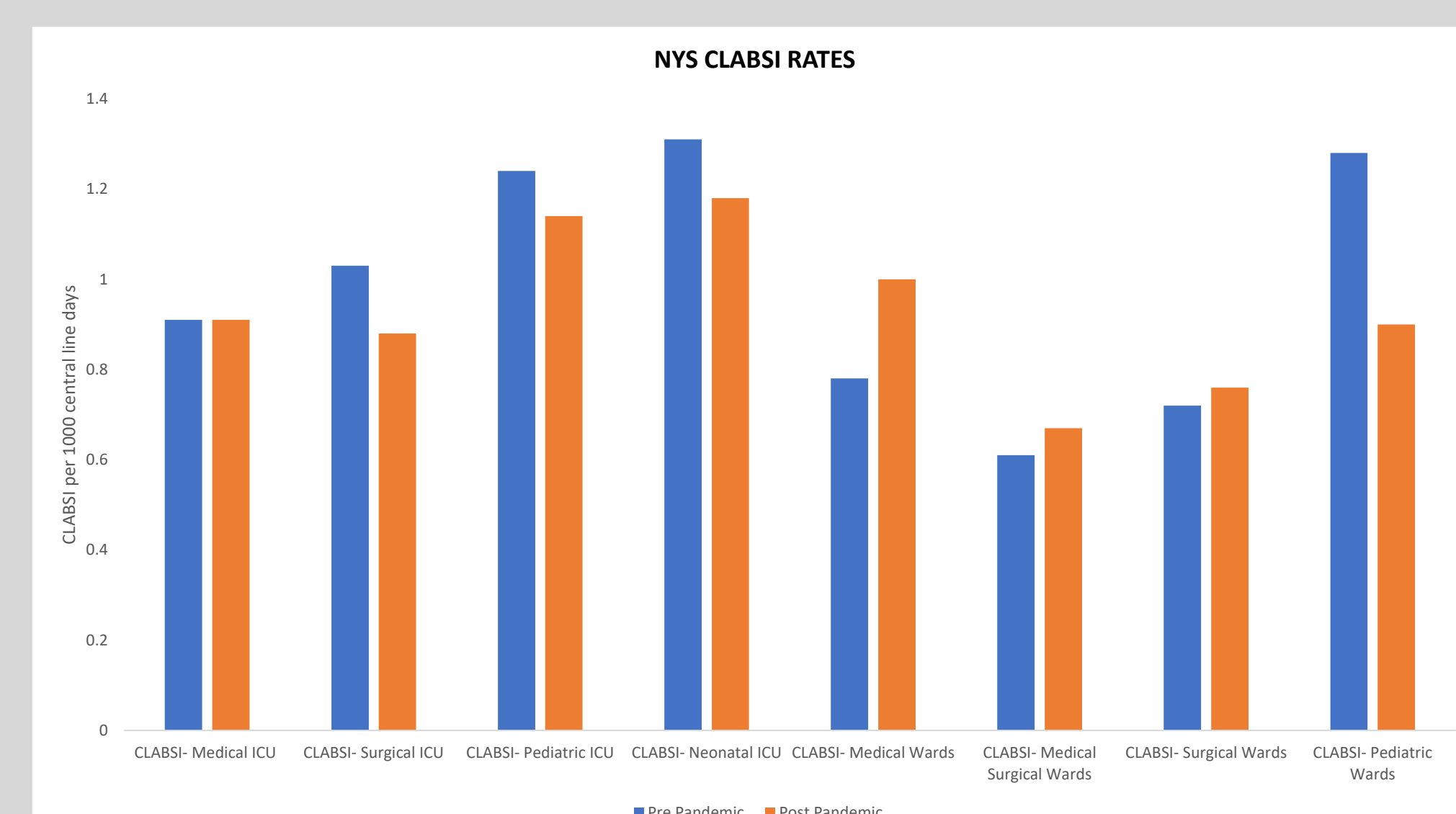
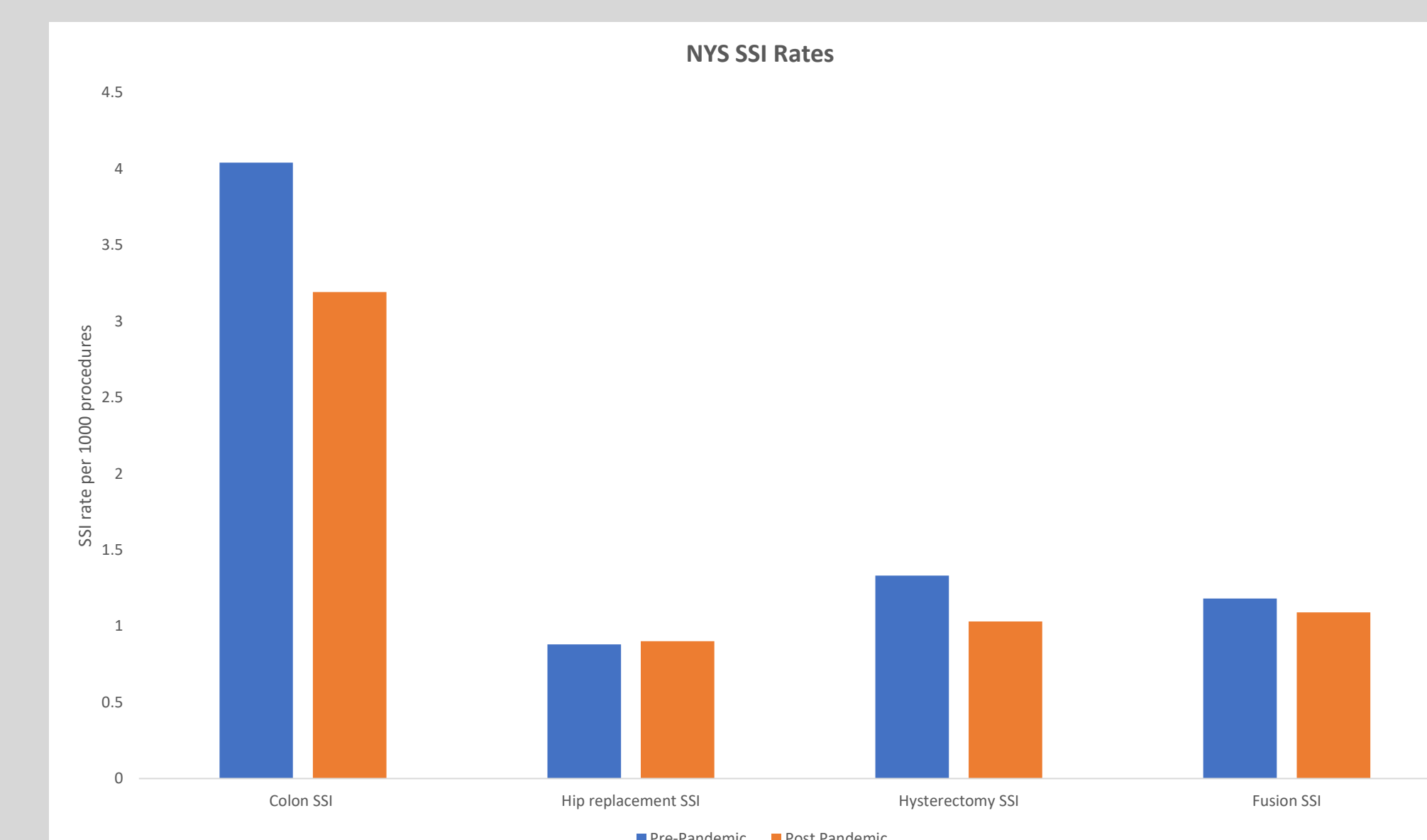


TABLE & FIGURE 2

TABLE 2: NYS SSI	Pre-Pandemic (CY 2019)	Post Pandemic (July 2020 to December 2020)	Associated z-test	p-value
SSI per 1000 procedures				
Colon SSI	4.04	3.19	3.4	0.0005*
Hip replacement SSI	0.88	0.90	0.2	0.8528
Hysterectomy SSI	1.33	1.03	1.9	0.04611*
Fusion SSI	1.18	1.09	0.8	0.4181



Discussion/Conclusion

Adult Impact

- The majority of hospitalization of COVID-19 were amongst adults. A NYC sample of hospitalized COVID-19 cases showed a median age of 63 and 39.7% female.
- Significant increase in CLABSIs was reported in the medical units only. There was an increase in CLABSIs in the medical ICUs, medical surgical wards, and surgical wards which may be of clinical significance.

Pediatric Impact

- As of July 29, 2021, 0.1% to 1.9% of all child COVID-19 cases resulted in hospitalization.
- NYC reported 5302.3 cases per 100,000 children.
- This accounts for 1.7 million NYC children and a little over 91,000 COVID-19 confirmed cases in children aged 0-17 years of age. Age distribution for NYC child COVID-19 cases was not available in the report.
- NYCs hospitalization rate was 1.9% and a death rate of 0.03%.
- Given the relatively low levels of COVID-19 on pediatric hospitalizations and deaths in NYC, it is expected that pediatric HAIs did not increase.

Potential Factors contributing to CLABSIs during the pandemic

- Delayed or deferred care
- Workflow redesigns
- Infection prevention practices
- PPE and supply shortages
- Human factors (e.g., staff fatigue, avoidance of exposure)
- Prone positioning

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There has been no better time to have studied public health than amidst the COVID-19 pandemic

Faculty Advisor

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