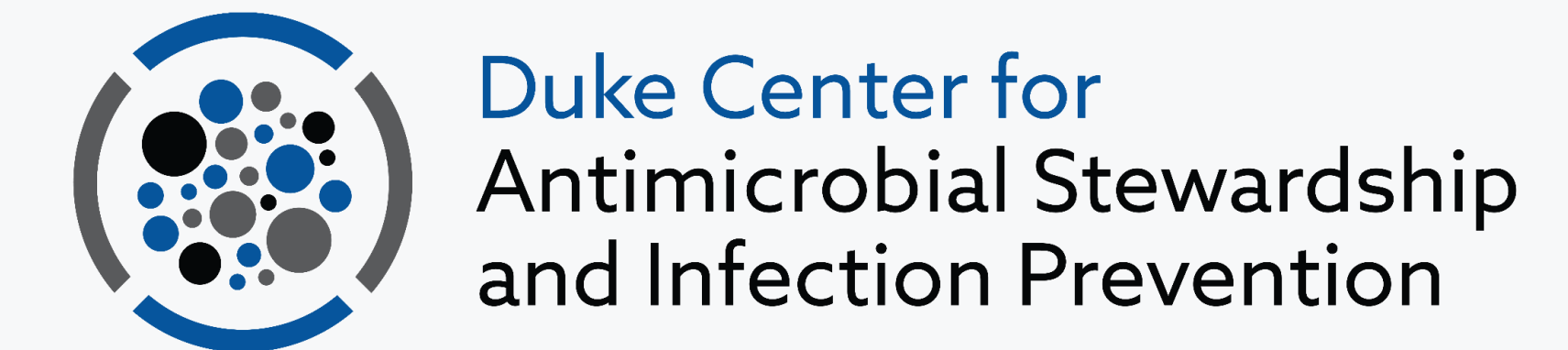


# Impact of COVID-19 Pandemic on Surgical Volume and Surgical Site Infections (SSI) in a Large Network of Community Hospitals



Gettler E<sup>1</sup>, Seidelman JL<sup>1,2</sup>, Smith BA<sup>1,2</sup>, Anderson DJ<sup>1,2</sup> for the CDC Prevention Epicenters Program  
1 - Division of Infectious Diseases, Duke University Medical Center, Durham, North Carolina, USA; 2 - Duke Center for Antimicrobial Stewardship and Infection Prevention, Duke University Medical Center, Durham, North Carolina, USA



## Abstract

**Background:** The COVID-19 pandemic significantly impacted hospitalizations and healthcare utilization. Diversion of infection prevention resources toward COVID-19 mitigation limited routine infection prevention activities such as rounding, observations, and education in all areas, including the peri-operative space. There were also changes in surgical care delivery. The impact of the COVID-19 pandemic on SSI rates has not been well described, especially in community hospitals.

**Methods:** We performed a retrospective cohort study analyzing prospectively collected data on SSIs from 45 community hospitals in the southeastern United States from 1/2018 to 12/2020. We included the 14 most commonly performed operative procedure categories, as defined by the National Healthcare Safety Network. Coronary artery bypass grafting was included a priori due to its clinical significance. Only facilities enrolled in the network for the full three-year period were included. We defined the pre-pandemic time period from 1/1/18 to 2/29/20 and the pandemic period from 3/1/20 to 12/31/20. We compared monthly and quarterly median procedure totals and SSI prevalence rates (PR) between the pre-pandemic and pandemic periods using Poisson regression.

**Results:** Pre-pandemic median monthly procedure volume was 384 (IQR 192-999) and the pre-pandemic SSI PR per 100 cases was 0.97 (IQR 0.90-1.04). There was a transient decline in surgical cases beginning in March 2020, reaching a nadir of 185 cases in April, followed by a return to pre-pandemic volume by June (figure 1). Overall and procedure-specific SSI PRs were not significantly different in the COVID-19 period relative to the pre-pandemic period (total PR per 100 cases 0.96 and 0.97, respectively, figure 2). However, when stratified by quarter and year, there was a trend toward increased SSI PR in the second quarter of 2020 with a PRR of 1.15 (95% CI 0.96-1.39, table 1).

**Conclusion:** The decline in surgical procedures early in the pandemic was short-lived in our community hospital network. Although there was no overall change in the SSI PR during the study period, there was a trend toward increased SSIs in the early phase of the pandemic (figure 3). This trend could be related to deferred elective cases or to a shift in infection prevention efforts to outbreak management.

## Background

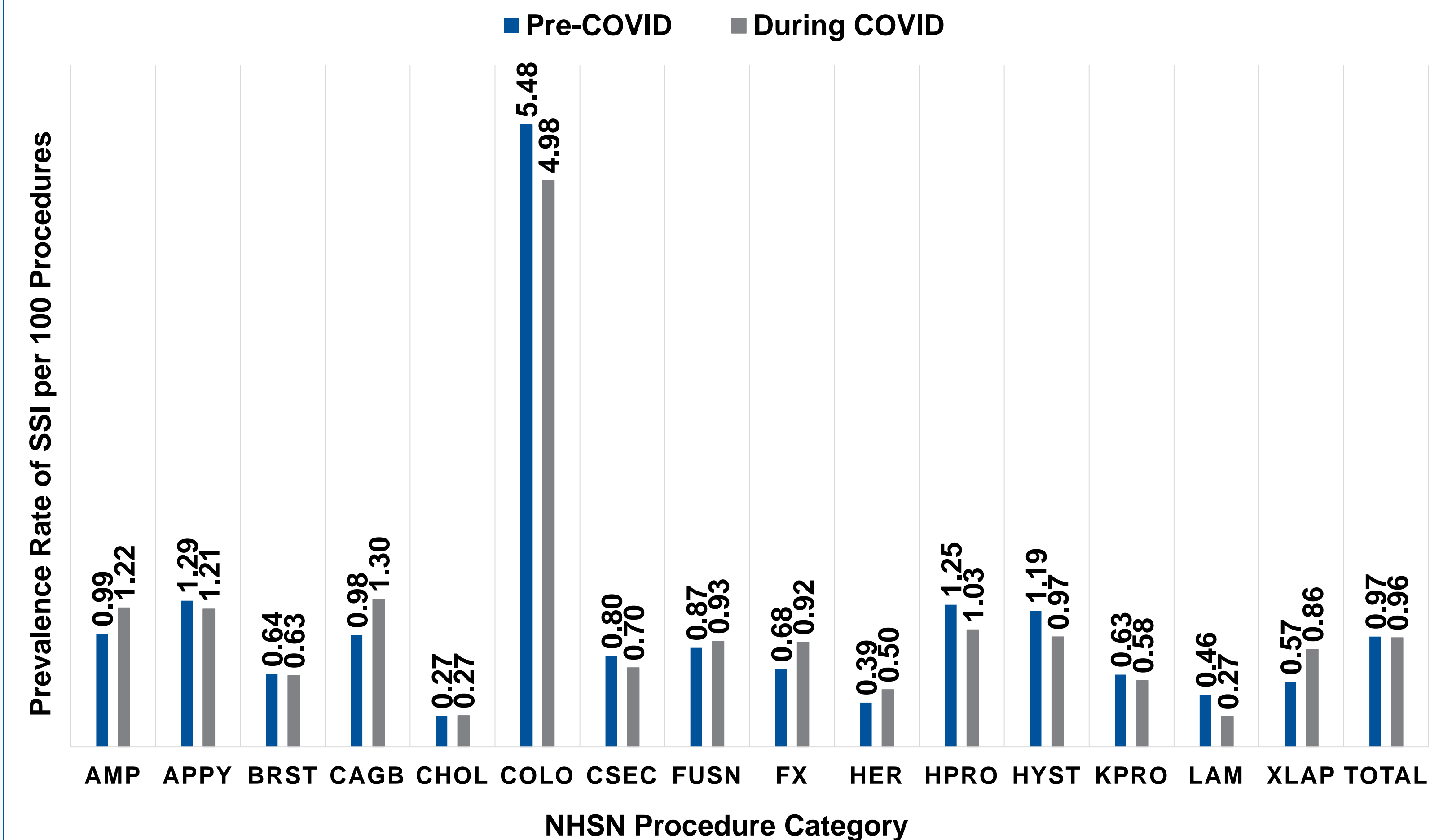
- COVID-19 has significantly impacted hospitalizations and healthcare utilization.
- Surgical care delivery has also been affected, particularly during periods of peak community transmission.
- Diversion of infection prevention resources to COVID-19 mitigation may have affected routine horizontal infection prevention strategies.
- The impact of the COVID-19 pandemic on SSI prevalence rates (PR) has not been well-described, particularly in community hospitals.

## Methods

- This is a retrospective cohort study of prospectively collected data from 45 community hospitals in the southeastern United States from 1/2018 to 12/2020.
- The pre-pandemic period was defined as 1/1/18 to 2/29/20, and the pandemic period from 3/1/20 to 12/31/20.
- The 14 most commonly performed procedure categories were included, as defined by the National Healthcare Safety Network (NHSN). Coronary artery bypass grafting was included a priori due to its clinical significance.
- Monthly and quarterly median procedure totals and SSI PR between pre-pandemic and pandemic periods were compared using Poisson regression.

## Results

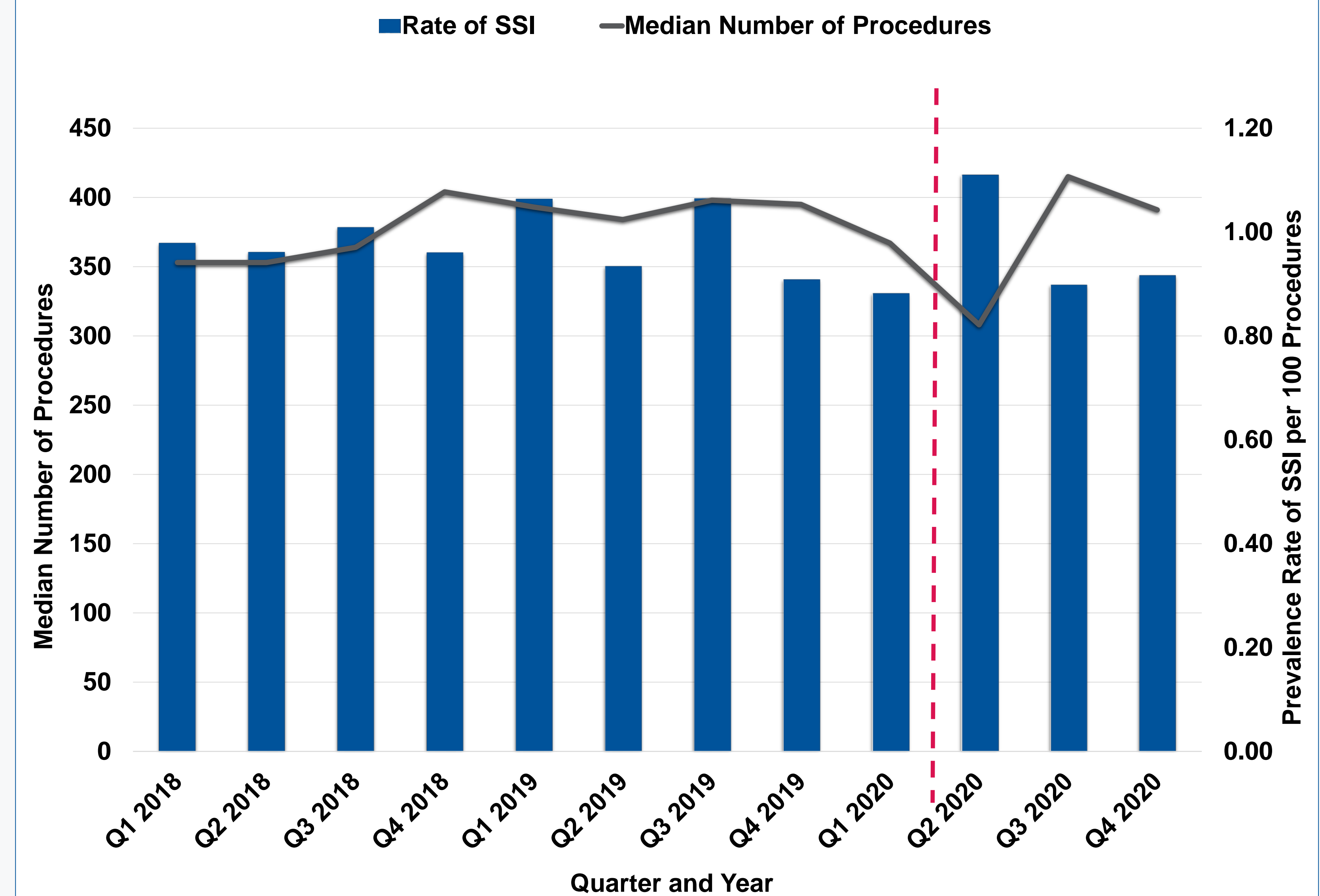
Figure 1 Prevalence Rate of Surgical Site Infections by NHSN Procedure Category Before and During the COVID-19 Pandemic<sup>1</sup>



<sup>1</sup>No statistically significant differences were observed.

## Results

Figure 2 Median Number of Surgical Procedures and Prevalence Rate of Surgical Site Infections by Quarter from 2018-2020<sup>1</sup>



<sup>1</sup>No statistically significant differences were observed.

## Conclusions

- In our community hospital network, the pandemic did not significantly impact SSI PR and the decline in surgical procedures observed early in the pandemic was transient.
- However, during this decline in procedure volume, there was a trend toward increased SSIs that did not reach statistical significance.

