

Seasonality of Surgical Site Infections Across the UHealth System: An Analysis of 352,074 Operations



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Conclusion

- Surgical site infections show a seasonal trend with increased peaks in the summer & troughs in the winter months.
- While both preoperative risk & postoperative surveillance show similar seasonal trends, the OE ratio is still significant over time, indicating that seasonality explains variation beyond patient preoperative risk. However, this was only seen at the teaching hospital & not the other hospitals.

Data Source/Population and Results:

- This was a retrospective review of 352,074 surgeries performed between 2014-19 at 5 UHealth hospitals divided into 3 regions.
- Individual preoperative risk & postoperative predicted probabilities were obtained by applying previously published ASPIN models to the EHR data. Observed/Expected (OE) Ratios were defined as the ratio of the sum of postoperative predicted probabilities to the sum of preoperative predicted probabilities. These were plotted by week. Non-parametric cubic smoothing splines were used to visualize trends.
- The majority of patients were female (58.6%), white (80.5%), & ASA Class I or II (61.2%), who underwent general (24.3%) or orthopedic (29.7%) surgeries.

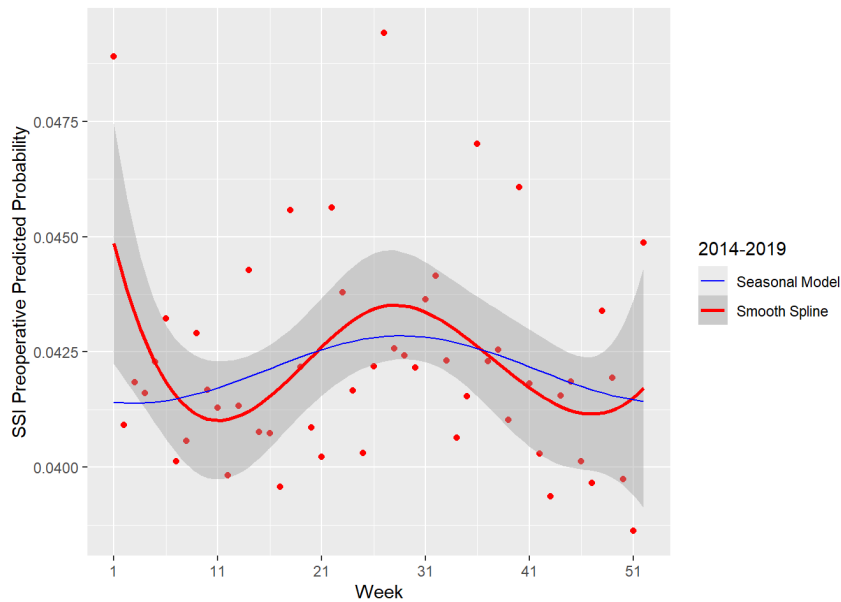
Lessons Learned

- SSIs are seasonal, with the highest rates around weeks 22-36 (end of May – beginning of September) ($P < 0.05$)
- Seasonality of SSI OE ratio was significant for Region 1 ($P\text{-value} = 0.01$) but not for Region 2 & Region 3 ($P > 0.05$)
- Region 1 = University of Colorado Hospital, Anschutz Medical Campus; Region 2 – Medical Center of the Rockies & Poudre Valley Hospital; Region 3 = Memorial Hospital Central & Memorial Hospital North.

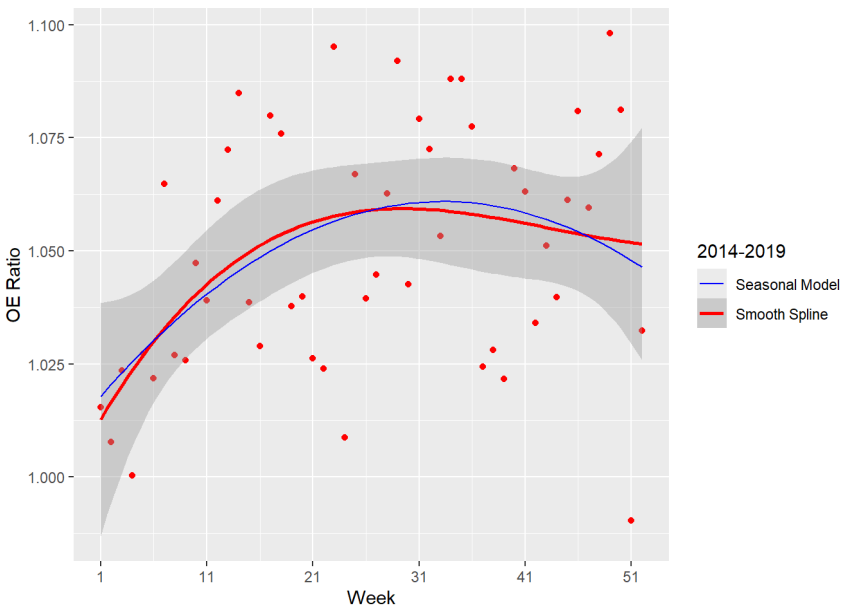
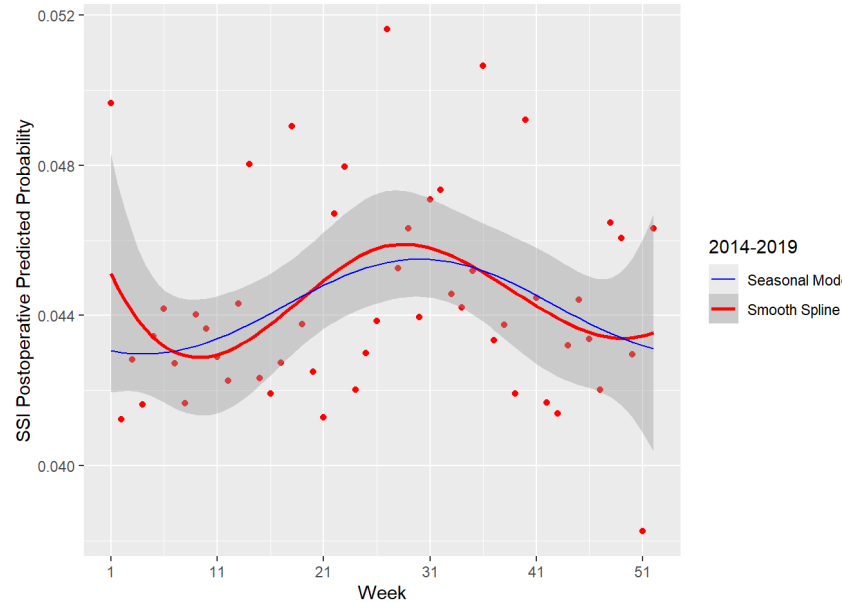
Significance statement

- This study is important because it opens the conversation about the importance of temporal planning in surgical outcomes that may reduce cost, rates of admission, & surgical-related morbidity & mortality.

Preoperative Predicted Probability of Infectious Complications



Postoperative Predicted Probability of Infectious Complications



OE Ratio of Infectious Complications