

Comparison of California Acute Care Hospital Central Line-Associated Bloodstream Infection Incidence by Hospital Location Before and During the COVID-19 Pandemic



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INTRODUCTION

- Central line-associated bloodstream infection (CLABSI) incidence among acute care hospitals (ACH) and in some hospital units such as critical care (CC) units increased substantially nationwide during the COVID-19 pandemic.^{1,2}
- We compared California (CA) ACH CLABSI incidence by location before and during the COVID-19 pandemic to identify locations with high burden to inform targeted prevention efforts.

METHODS

- We used California ACH (n=327) CLABSI standardized infection ratio (SIR) data from the National Healthcare Safety Network (NHSN).
- We compared SIRs during the second halves of 2019 (2019H2) and 2020 (2020H2) to evaluate early pandemic changes, and during 2019 (pre-pandemic) and 2021 (pandemic) periods for:
 - 5 hospital types, 9 location types (e.g., critical care (CC)), and 58 hospital units (e.g., medical CC), excluding rehabilitation units.
- We compared SIRs between study periods applying a mid-p exact test.³

R E S U L T S

Table 1. Summary of ACH CLABSI SIR % Changes

	Annual	Half Years		
	2019/ 2021	2019H2/ 2020H2	2020H2/ 2021H1	2021H1/ 2021H2
Statewide	+34%	+51%	0%	-16%
Hospital type				
Community, <125 Beds	+75%	+101%	-13%	0%
Community, 125-250 Beds	+31%	+41%	2.7%	-13%
Community, >250 Beds	+70%	+100%	4.8%	-14%
Major Teaching	+29%	+43%	-2.1%	-16%
Pediatric	-6.8%	-19%	-21%	-25%
Location				
Critical Care (CC) Units	+69%	+89%	-4.3%	-14%
Medical-Surgical CC	+78%	+95%	-4.4%	-7.3%
Medical CC	+78%	+141%	-26%	-1.2%
Respiratory CC	181%	-	2.6%	-46%
Surgical CC	+74%	68%	12%	-11%
Trauma CC	35%	+145%	-36%	-18%
Step-Down Units	+68%	34%	19%	-7.4%
Adult Step-Down	+72%	39%	19%	-10%
Wards	1.6%	+19%	2.9%	-17%
Medical Ward	-10%	+49%	-25%	-14%

Significantly **higher** or **lower**

Figure 3. ACH CLABSI SIR Before and During Pandemic Periods, by Hospital Unit

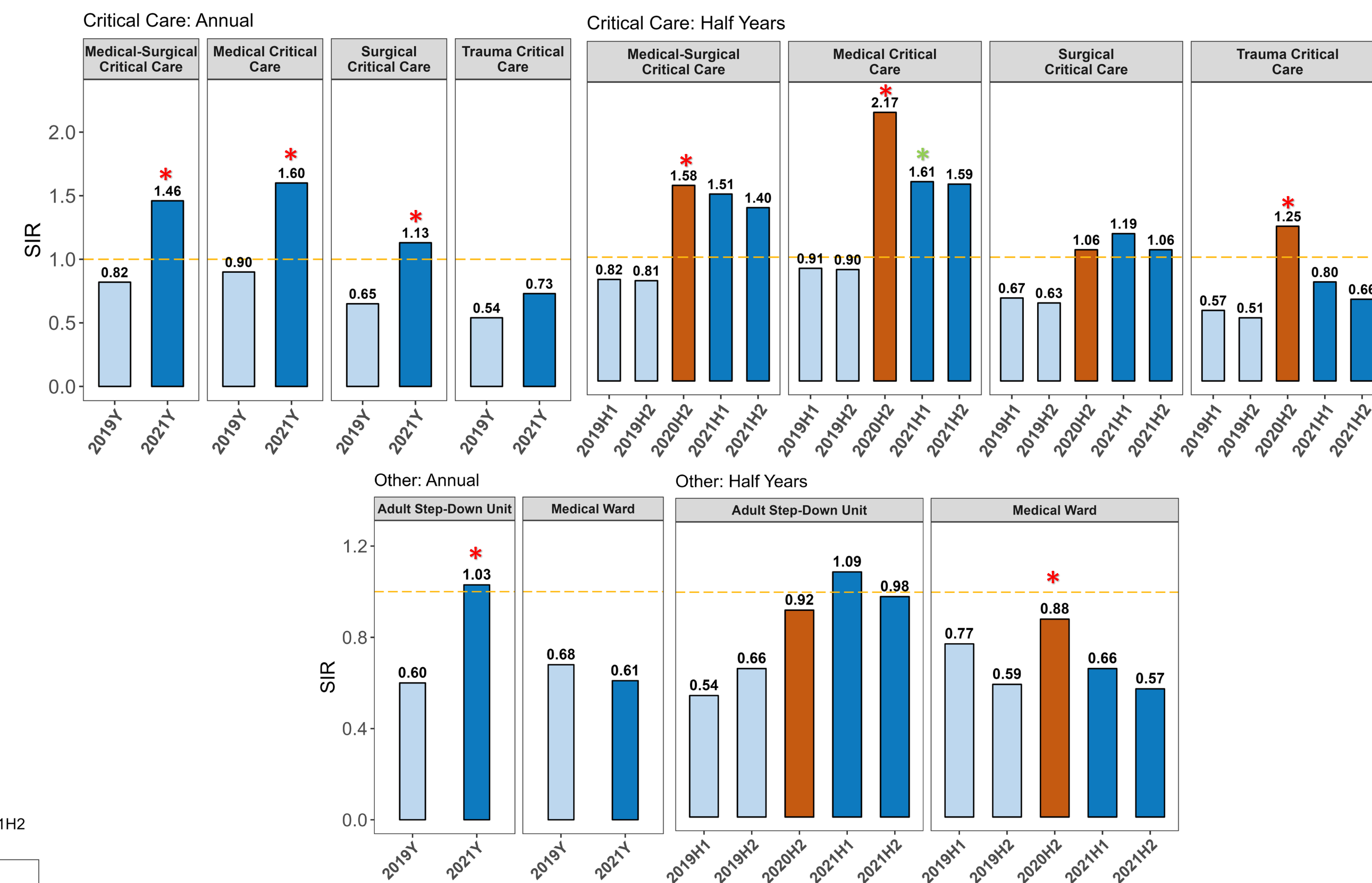
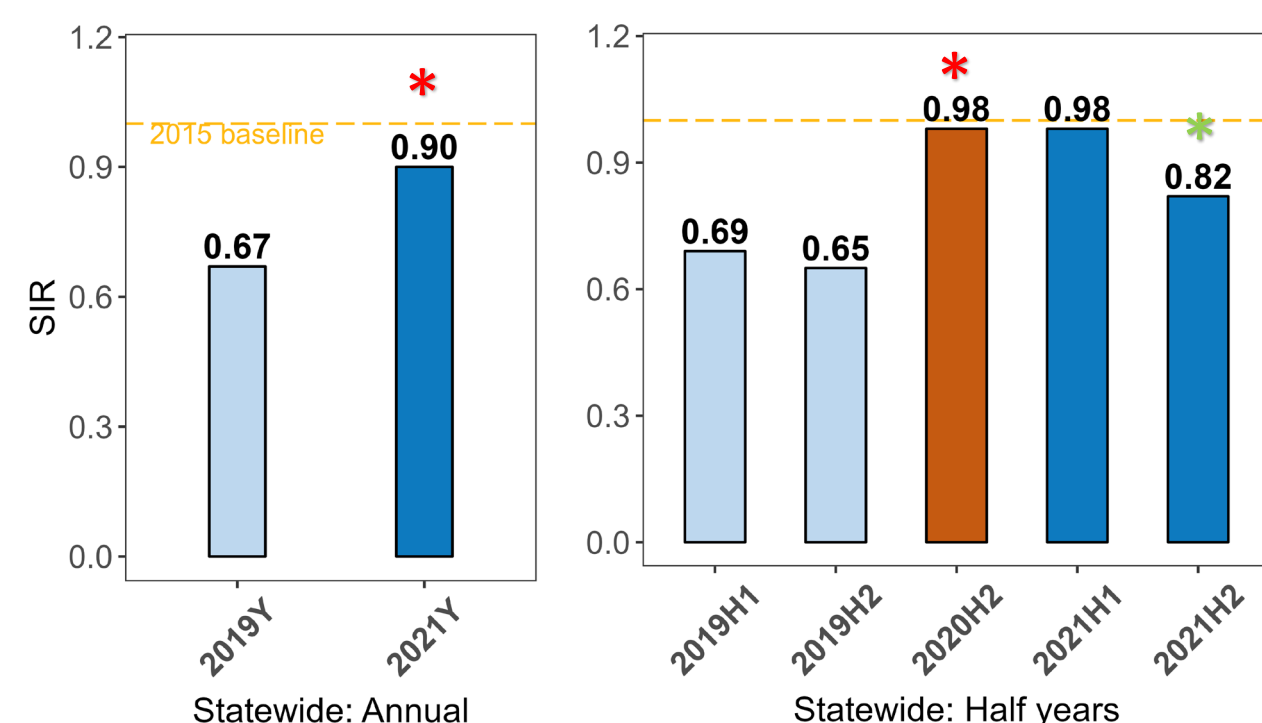
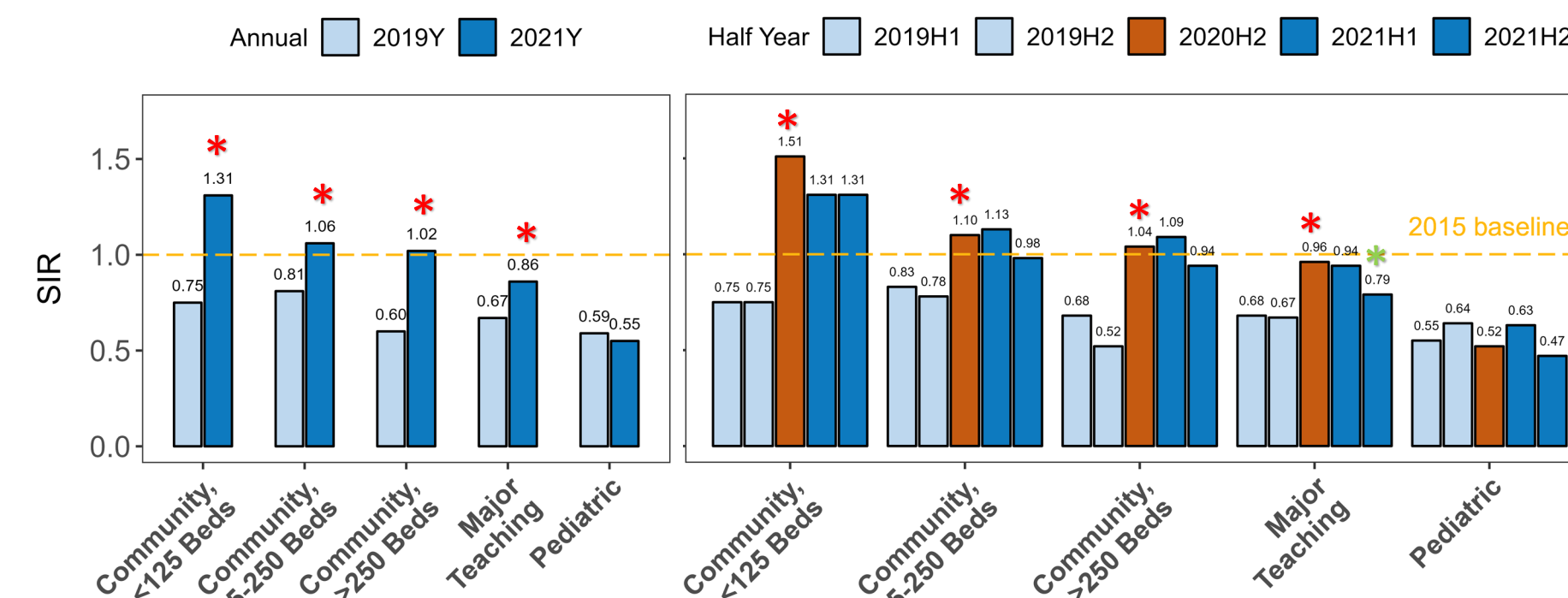


Figure 1. CA ACH CLABSI SIR Before and During Pandemic Periods



- CLABSI SIR increased statewide from 2019H2 to 2020H2 by 51% and from 2019Y to 2021Y by 34%.

Figure 2. ACH CLABSI SIR Before and During Pandemic Periods, by Hospital Type



- Small community hospitals had the highest SIR and % increases during the pandemic with no downward trend after 2021H1.
- Other community hospitals indicated a non-significant downward trend in 2021H2.

CONCLUSIONS

- Overall statewide increases in hospital CLABSI incidence, especially in community hospitals and critical care locations during the pandemic, mirror findings from similar studies.^{1,2,4}
- Although SIR increases in 2020H2 and 2021H1 relative to the pre-pandemic period were decreasing by 2021H2, most locations had persistently higher incidence for 2021Y compared with 2019Y.
- Findings will be used to guide public health support for California hospital infection prevention programs to further reduce CLABSI incidence.

References: 1. Patel PR, Weiner-Lastinger LM, Dudeck MA, et al. Impact of COVID-19 pandemic on central-line-associated bloodstream infections during the early months of 2020, National Healthcare Safety Network. *Infect Control Hosp Epidemiol.* 2021;1-4. 10.1017/ice.2021.108; 2. Lastinger, L., Alvarez, C., Kofman, A., Konnor, R., Kuhar, D., Nkwata, A., . . . Dudeck, M. (2022). Continued increases in the incidence of healthcare-associated infection (HAI) during the second year of the coronavirus disease 2019 (COVID-19) pandemic. *Infection Control & Hospital Epidemiology*, 1-5. 10.1017/ice.2022.116; 3. Centers for Disease Control and Prevention. National Healthcare Safety Network. Patient safety analysis resources. Statistical tools. User guide for statistical analysis tools. A guide to using the NHSN macros May 2021. Accessed August 2022. <https://www.cdc.gov/nhsn/sas/macros-guide-508.pdf>; 4. Sonali D Advani, MBBS, MPH, Emily Sickbert-Bennett, PhD, MS, Rebekah Moehring, MD, MPH, Andrea Cromer, BSN, MPH, CIC, Yuliya Lohknygina, PhD, Elizabeth Dodds-Ashley, PharmD, MHS, Ibukunoluwa C Kalu, MD, Lauren DiBiase, MS, CIC, David J Weber, MD; MPH, Deverick J Anderson, MD, MPH, for the CDC Prevention Epicenters Program, The Disproportionate Impact of COVID-19 Pandemic on Healthcare-Associated Infections in Community Hospitals: Need for Expanding the Infectious Disease Workforce, *Clinical Infectious Diseases*, 2022; , ciac684, <https://doi.org/10.1093/cid/ciac684>