WISCONSIN DEPARTMENT of HEALTH SERVICES
Division of Public Health
P-00340 (05/2022)

Healthcare-Associated Infections Prevention Program—2020 Report

Healthcare-associated infections (HAIs) are infections that occur while receiving health care. Patients undergoing surgical procedures or who have medical devices such as central lines, urinary catheters, and ventilators are at risk of acquiring HAIs. Infections caused by multidrug-resistant organisms such as methicillin-resistant *Staphylococcus aureus* (MRSA) can also be acquired in various health care settings.

The Wisconsin Division of Public Health (DPH) collects HAI data from hospitals on a voluntary basis and publicly reports aggregate data to monitor trends and to compare Wisconsin HAI occurrence to the national baseline. This comparison is made using a standardized infection ratio (SIR), calculated by dividing the number of observed HAIs by the number predicted based on national pooled data. These national data are collected through the Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN) and are represented in each graph with a value of 1.00 and a black line. Hospital-specific data are displayed on the Wisconsin Hospital Association CheckPoint® website.

The NHSN system adjusts the SIR for a facility or state to account for risk factors that might cause infection rates to be higher or lower. The specific factors included in the risk adjustment for each infection type varies, but often includes hospital size and teaching status, patient population served by a hospital, and surgical patient characteristics. Lower SIRs indicate better progress toward preventing HAIs.

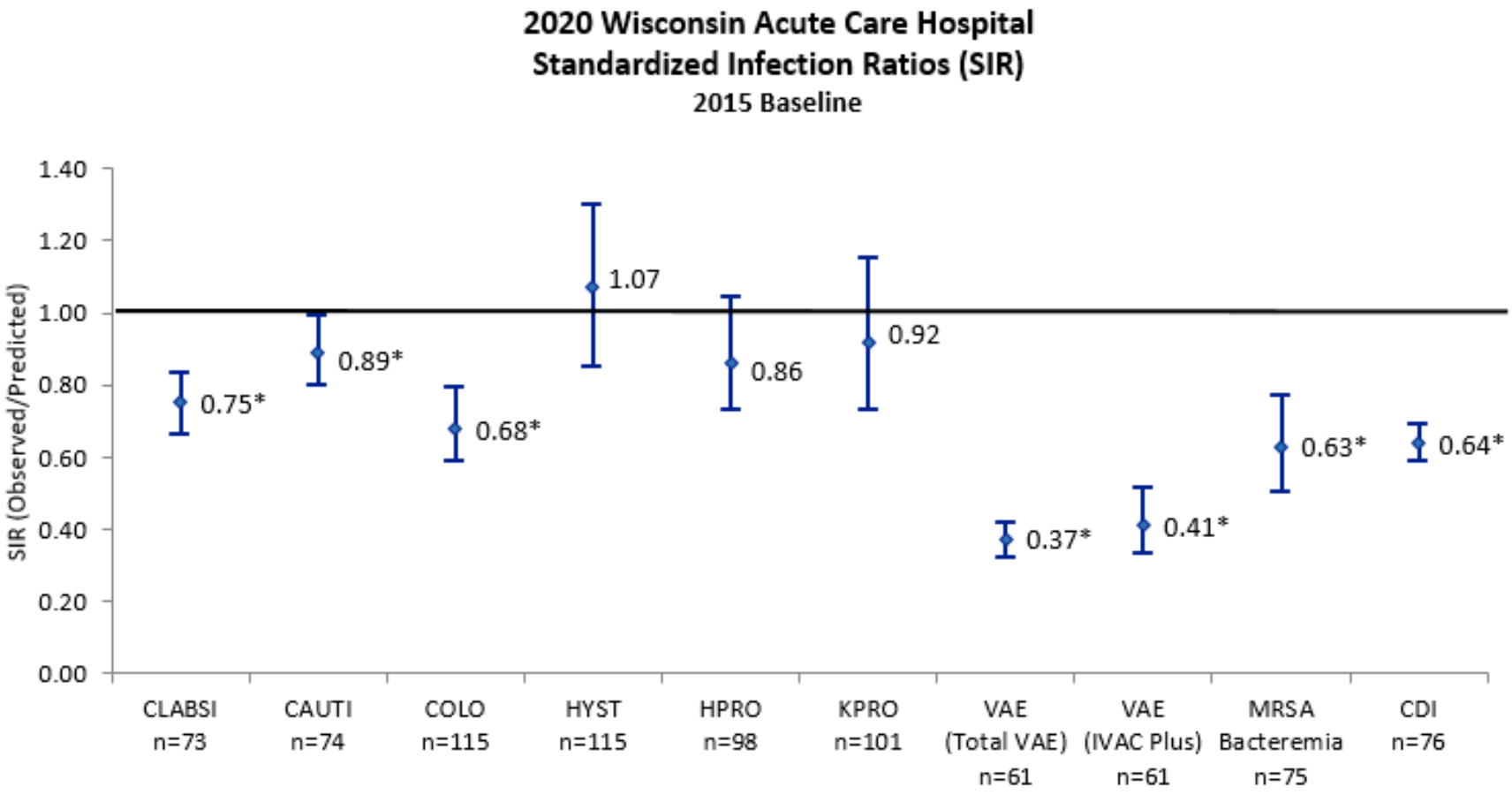
This report includes 2020 data for six HAIs: Central line-associated bloodstream infections (CLABSI), catheter-associated urinary tract infections (CAUTI), ventilator-associated events (VAE), surgical site infections (SSI), MRSA bacteremia (MRSA in the bloodstream), and *Clostridioides difficile* infections (CDI). Data were accessed from NHSN during July 2021 to allow sufficient time for complete data collection and reporting for calendar year 2020. Among 133 eligible Wisconsin hospitals, all provided data regarding at least one type of HAI to DPH.

As shown in Figures 1 and 2 below, several types of HAIs occurred less frequently than predicted in Wisconsin hospitals in 2020 when compared to the 2015 national baseline. For Wisconsin acute care hospitals, the 2020 SIRs for CAUTI, CLABSI, MRSA bacteremia, and CDI were lower than the 2015 national baseline, and these differences were statistically significant. For critical access hospitals in Wisconsin, the SIRs for CAUTI and CDI were significantly lower than the 2015 national baseline. Looking at SSIs for both hospital types combined, the SIR for SSIs after colon surgeries was also significantly lower than the national baseline.

Detailed information, including a comparison of 2019 and 2020 Wisconsin HAI data, the number of hospitals with a SIR above the national baseline, SIR values at key percentiles, and location-specific SIRs, is available on the following pages. Where possible, annual data are also displayed separately for critical access and acute care hospitals. Critical access hospitals are those in rural areas with an official federal billing designation, have 25 or fewer acute care inpatient beds, are located more than 35 miles from another hospital, maintain an average length of stay of 96 hours or less, and provide emergency care services. The remaining acute care hospitals, including children's hospitals, are grouped separately into reports.

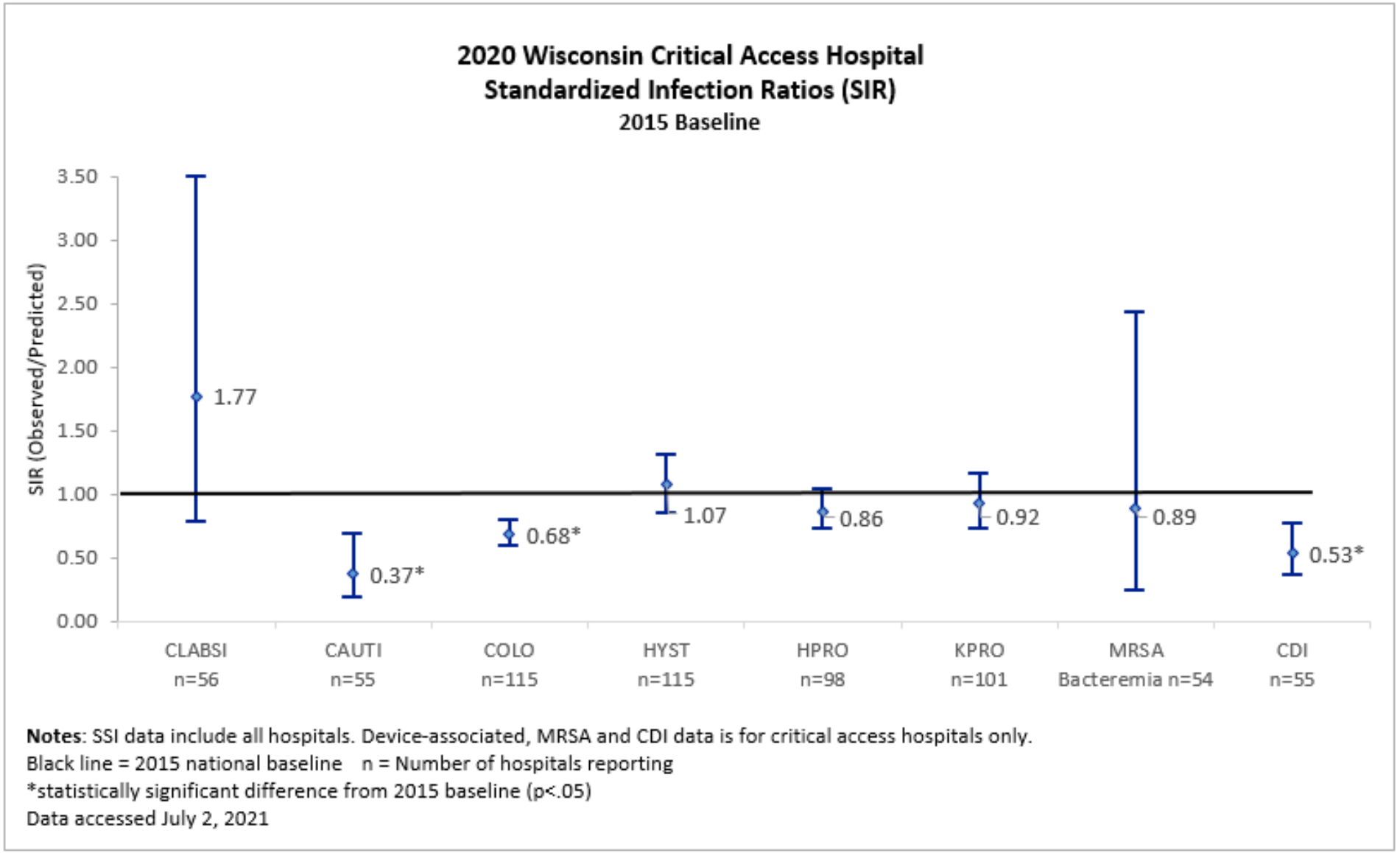
Special note on 2020 HAI Prevention Program Annual Report. The COVID-19 pandemic impacted hospital operations across the country for much of 2020, including HAI prevention efforts. A paper published by NHSN researchers[1] in September 2021 showed a significant increase in national-level SIRs for several HAI types in 2020, as compared to the same period in 2019. The authors noted that for some HAI types, the COVID-19 pandemic appeared to have at least temporarily reversed general trends showing improvements in HAIs at the national level in recent years. Readers of this report are encouraged to consider the potential impact of COVID-19 on Wisconsin HAI data for 2020.

Figure 1



Notes: SSI data include all hospitals. Device-associated, MRSA and CDI data is for acute care hospitals only.
Black line = 2015 national baseline n = Number of hospitals reporting
*statistically significant difference from 2015 baseline (p<.05)
Data accessed July 2, 2021

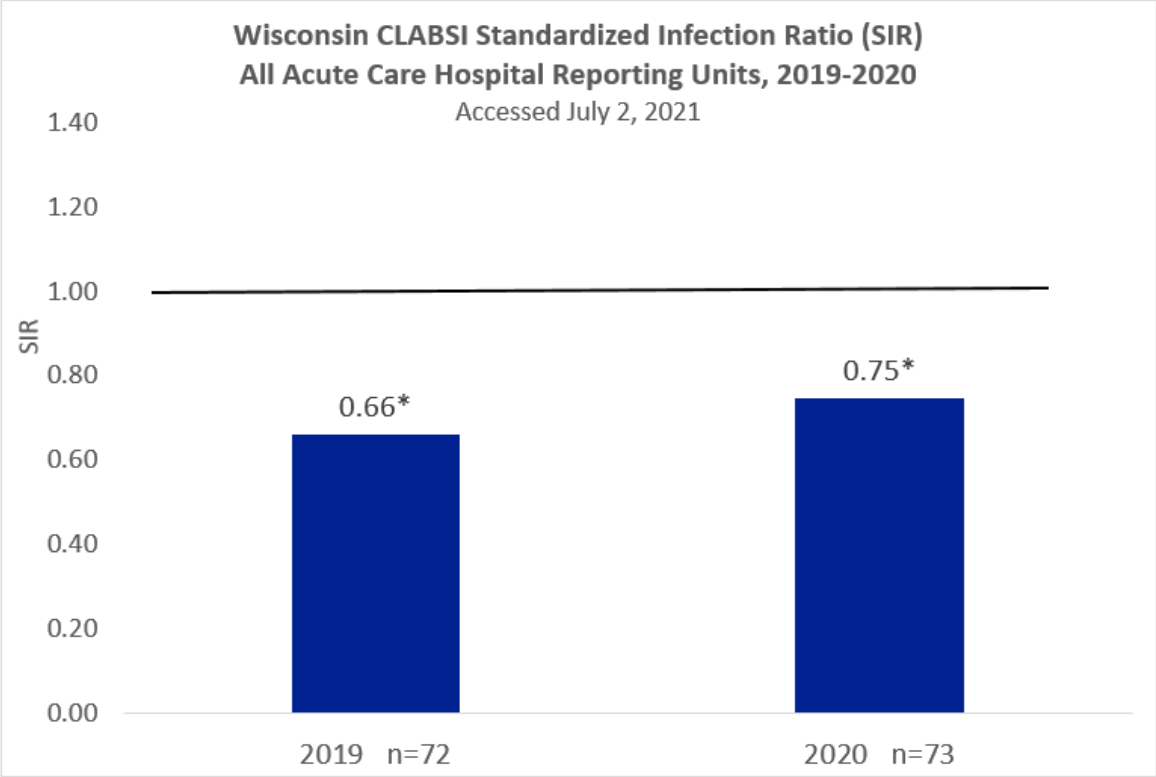
Figure 2



Notes: SSI data include all hospitals. Device-associated, MRSA and CDI data is for critical access hospitals only.
Black line = 2015 national baseline n = Number of hospitals reporting
*statistically significant difference from 2015 baseline (p<.05)
Data accessed July 2, 2021

Central Line-Associated Bloodstream Infections (CLABSI): Acute Care Hospitals

At the national level, there was a 24% increase in CLABSIs from 2019 to 2020, with the largest increase (50%) in intensive care units (ICUs). At the same time, acute care hospitals in the majority of states (n=31) still performed better than the 2015 national baseline for CLABSI in 2020. These data come from the 2020 National and State Healthcare-Associated Infections Progress Report.[2]



WI Acute Care Hospital SIR Values at Key Percentiles

- 10th percentile: 0.22
- 25th percentile: 0.53
- 50th percentile: 0.67
- 75th percentile: 0.99
- 90th percentile: 1.49

Number of acute care hospitals with SIR >1.0 for 2020: **11 (15%)**

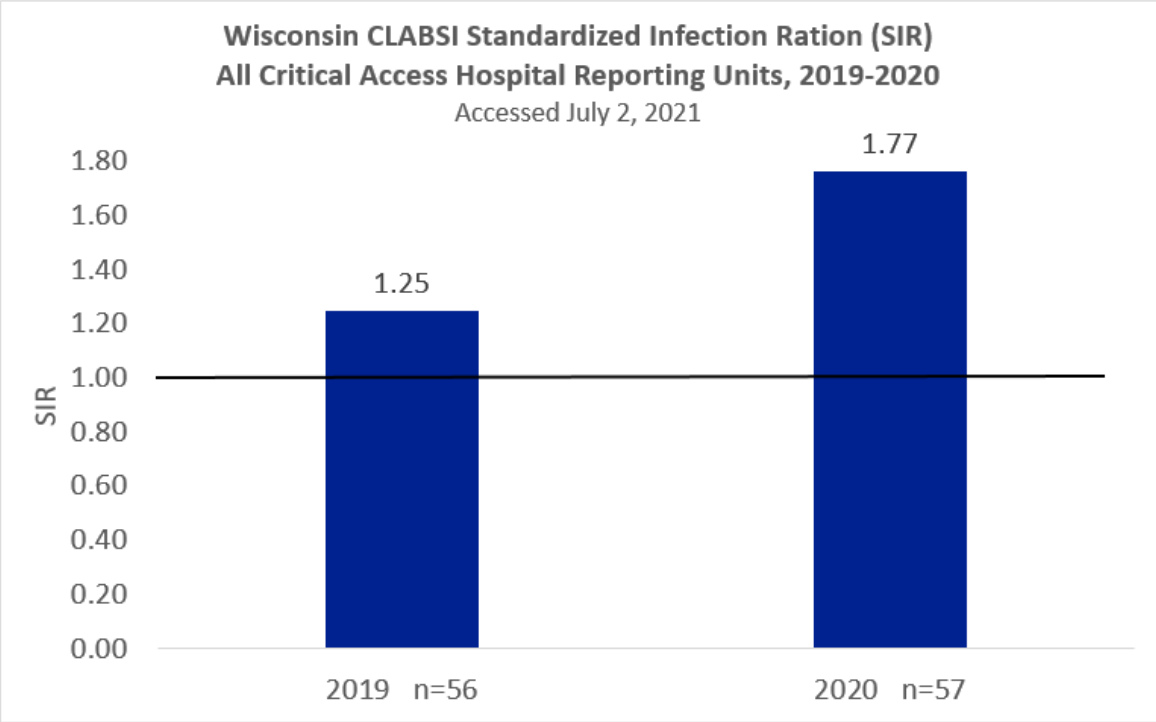
Black line = 2015 national baseline n = Number of reporting hospitals

*Statistically significant difference from national baseline

Unit Type	Number of Reporting Hospitals (Units)	Number of Infections	2020 SIR	Confidence Interval	Percent Change from 2019–2020
All units combined	73 (487)	296	0.75*	0.66–0.83	13% increase
NICUs	16 (16)	19	1.36	0.84–2.08	41% increase
ICUs	63 (97)	121	0.89	0.74–1.06	71% increase
Non-ICUs	73 (374)	156	0.63*	0.54–0.73	11% decrease

CLABSI: Critical Access Hospitals

Among critical access hospitals reporting CLABSI data into NHSN in the U.S., the number of CLABSIs increased from 25 in 2019 to 40 in 2020, a 60% increase.[2,3] As shown below, the CLABSI SIR for critical access hospitals in Wisconsin also increased from 2019 to 2020. These increases in the SIRs at national and state level were not statistically significant.



No critical access hospital had enough data to calculate a facility-level SIR for the year.

10th percentile:

25th percentile:

50th percentile:

75th percentile:

90th percentile:

Number of critical access hospitals with SIR >1.0 for 2020: N/A

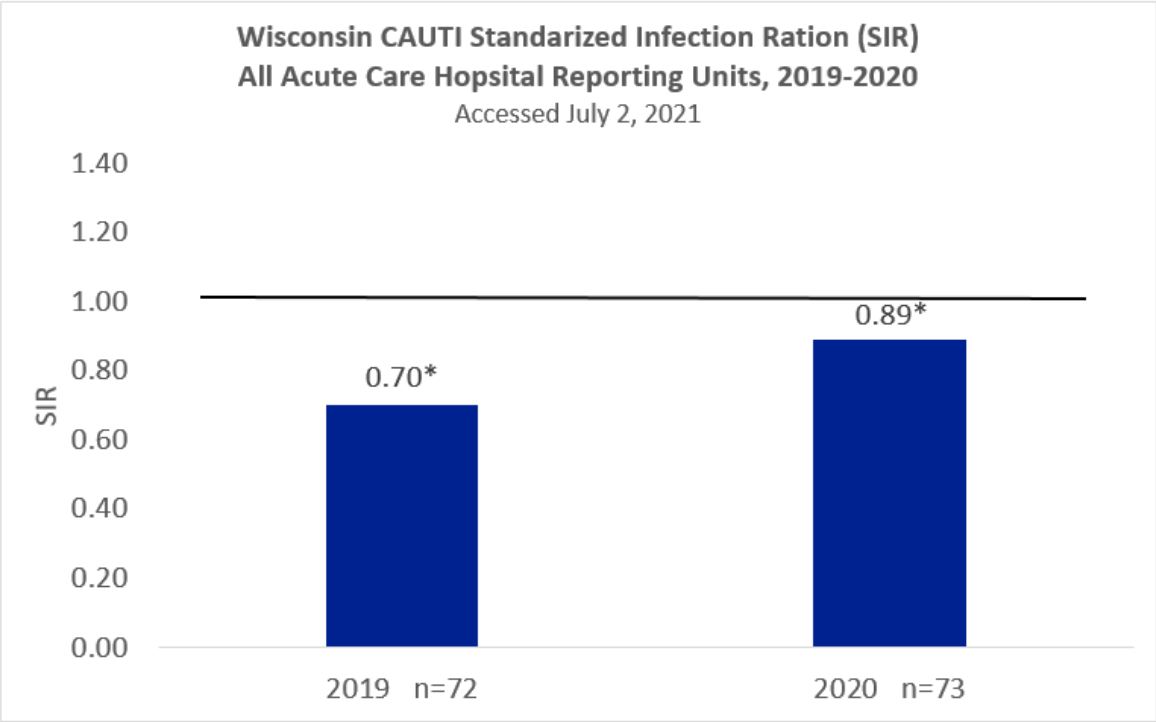
Black line = 2015 national baseline n = Number of reporting hospitals

*Statistically significant difference from national baseline

Unit Type	Number of Reporting Hospitals (Units)	Number of Infections	2020 SIR	Confidence Interval	Percent Change from 2019–2020
All units combined	57 (89)	7	1.77	0.77–3.49	41% increase
ICUs	13 (13)	1	Not calculated		
Non-ICUs	57 (76)	6	1.57	0.64–3.26	21% increase

Catheter-Associated Urinary Tract Infections (CAUTI): Acute Care Hospitals

At the national level, there was no statistically significant change in CAUTIs from 2019 to 2020 among acute care hospitals.[2] In Wisconsin, acute care hospitals saw a statistically significant increase in CAUTIs form 2019 to 2020.



WI Acute Care Hospital SIR Values at Key Percentiles

- 10th percentile: 0.27
- 25th percentile: 0.50
- 50th percentile: 0.88
- 75th percentile: 1.39
- 90th percentile: 2.01

Number of acute care hospitals with SIR >1.0 for 2020: **20 (27%)**

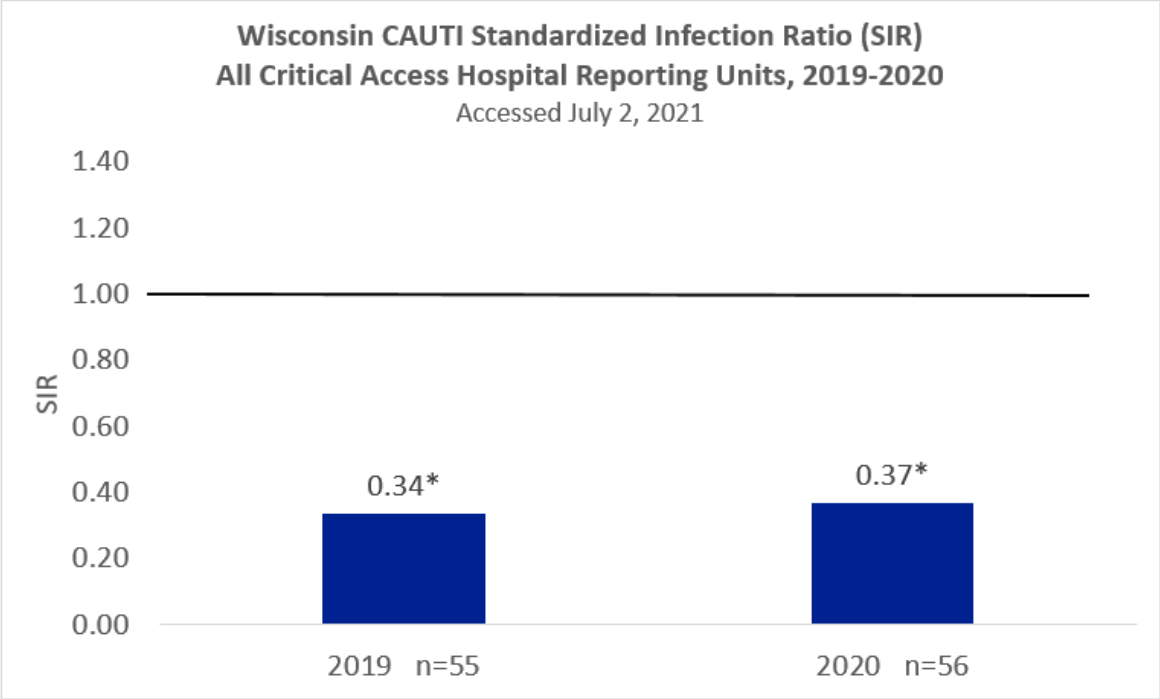
Black line = 2015 national baseline n = Number of reporting hospitals

*Statistically significant difference from national baseline ^Statistically significant difference

Unit Type	Number of Reporting Hospitals (Units)	Number of Infections	2020 SIR	Confidence Interval	Percent Change from 2019–2020
All units combined	73 (484)	353	0.89*	0.80–0.99	27% increase^
ICUs	64 (100)	173	0.95	0.81–1.09	25% increase
Non-ICUs	73 (384)	180	0.85*	0.73–0.98	29% increase^

CAUTI: Critical Access Hospitals

At the national level, the number of CAUTIs reported by critical access hospitals increased slightly from 174 in 2019 to 186 in 2020, a 7% increase.[2,3] Wisconsin critical access hospitals saw a similar increase of 9% in CAUTIs from 2019 to 2020. Neither of these increases was statistically significant.



WI Critical Access Hospital SIR Values at Key Percentiles

- 10th percentile: 0.00
- 25th percentile: 0.00
- 50th percentile: 0.00
- 75th percentile: 0.50
- 90th percentile: 0.97

Number of critical access hospitals with SIR >1.0 for 2020: **2 (4%)**

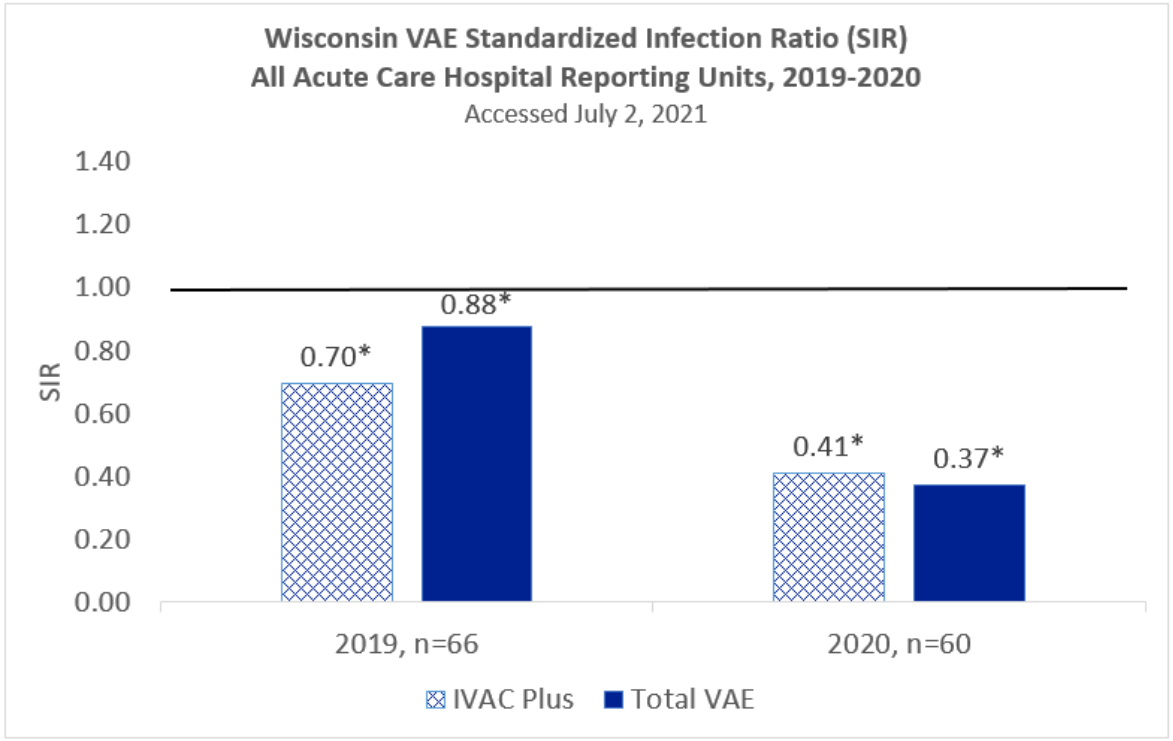
Black line = 2015 national baseline n = Number of reporting hospitals

*Statistically significant difference from national baseline

Unit Type	Number of Reporting Hospitals (Units)	Number of Infections	2020 SIR	Confidence Interval	Percent Change from 2019–2020
All units combined	56 (88)	9	0.37*	0.18–0.67	9% increase
ICUs	13 (13)	1	0.66	0.03–3.25	100% increase
Non-ICUs	56 (75)	8	0.35*	0.16–0.67	3% decrease

Ventilator-Associated Events (VAE): Acute Care Hospitals

Surveillance for ventilator-associated events includes both infections and other conditions that may or may not represent true infections. The "Total VAE" measure includes all ventilator-associated events. "IVAC Plus" includes all ventilator-associated events except for ventilator-associated conditions. Data shown is for acute care hospitals only.



WI Acute Care Hospital Total VAE SIR Values at Key Percentiles

- 10th percentile: 0.00
- 25th percentile: 0.00
- 50th percentile: 0.00
- 75th percentile: 1.09
- 90th percentile: 1.81

Number of acute care hospitals with Total VAE SIR >1.0 for 2020: **10 (17%)**

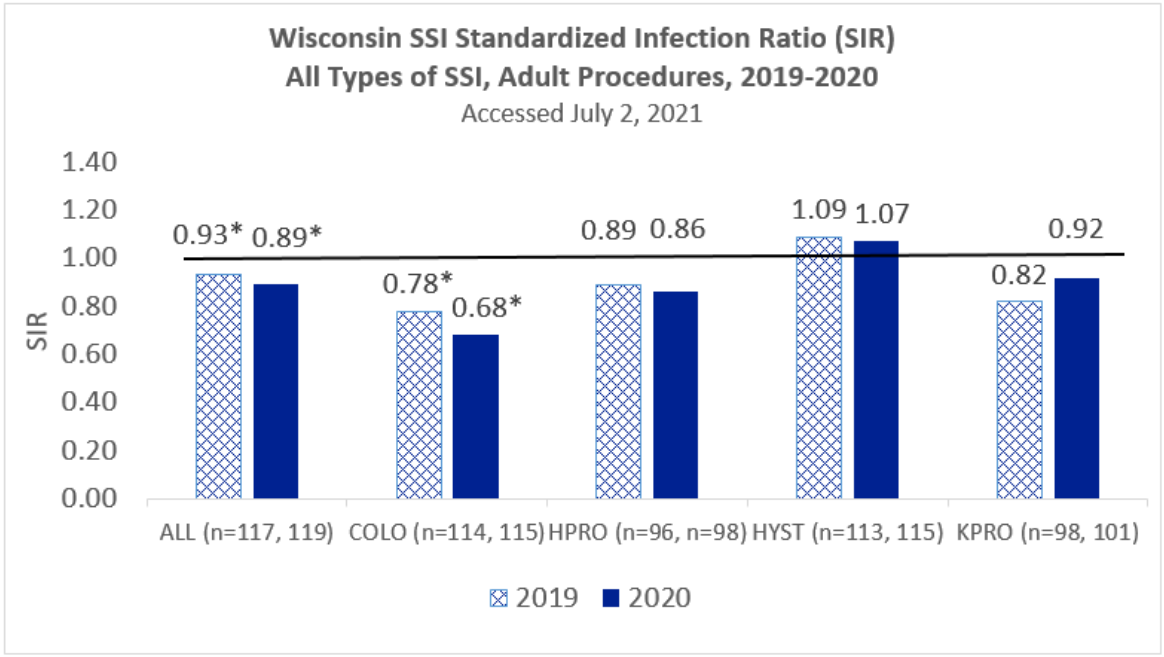
Black line = 2015 national baseline n = Number of reporting hospitals

*Statistically significant difference from national baseline ^Statistically significant difference

Unit Type	Number of Reporting Hospitals (Units)	Number of Infections	2020 SIR	Confidence Interval	Percent Change from 2019–2020
IVAC Plus	60 (349)	83	0.41*	0.33–0.51	41% decrease^
Total VAE	60 (349)	207	0.37*	0.32–0.43	58% decrease^

Surgical Site Infections (SSI): All Hospitals

Surgical site infections are classified by the type of procedure with which they are associated, as well as the depth of the infection, and can involve tissues under the skin, organs, or implanted material. The data below are for adult procedures in acute care and critical access hospitals combined. There were no statistically significant changes in the SIRs for any of the procedure types shown from 2019 to 2020 for Wisconsin hospitals.



WI Hospital SIR Values at Key Percentiles

- 10th percentile: 0.00
- 25th percentile: 0.37
- 50th percentile: 0.66
- 75th percentile: 1.11
- 90th percentile: 1.46

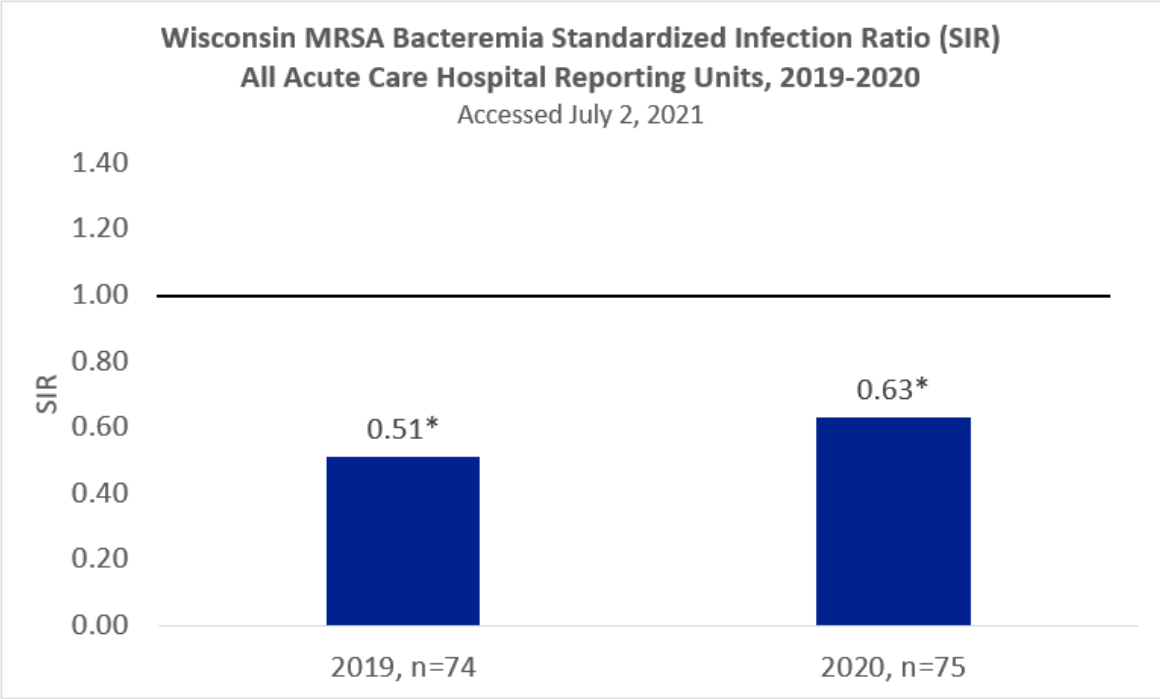
Number of hospitals with SIR >1.0 for all procedures combined for 2020: **24 (21%)**

Black line = 2015 national baseline n = Number of reporting hospitals
*Statistically significant difference from national baseline

Unit Type	Number of Reporting Hospitals (Procedures)	Number of Infections (Any Type of SSI)	2020 SIR (Superficial, Deep, and Organ/Space Infections)	Confidence Interval	Percent Change from 2019–2020
All procedures combined	815 (60,569)	965	0.93	0.83–0.95	4% decrease
Colon procedures (COLO)	115 (5,263)	181	0.68	0.59–0.79	13% decrease
Hip replacement (HPRO)	98 (11,209)	99	0.86	0.70–1.04	3% decrease
Abdom. hysterectomy (HYST)	115 (4,502)	75	1.07	0.85–1.30	2% decrease
Knee replacement (KPRO)	101 (14,471)	77	0.92	0.73–1.15	13% increase

Methicillin-resistant *Staphylococcus aureus* (MRSA) Bacteremia: Acute Care Hospitals:

Patients treated with antibiotics or who have devices such as central lines, urinary catheters, or ventilators are at high risk of acquiring HAIs caused by MRSA and other multidrug-resistant organisms. This measure includes laboratory-identified MRSA in the bloodstream occurring more than three days after a hospital admission. At the national level, there was a 15% increase in the MRSA bacteremia SIR between 2019 and 2020.[2] The MRSA bacteremia SIR for Wisconsin acute care hospitals increased slightly in 2020, but this was not a statistically significant increase.



WI Acute Care Hospital SIR Values at Key Percentiles

- 10th percentile: 0.00
- 25th percentile: 0.09
- 50th percentile: 0.59
- 75th percentile: 0.99
- 90th percentile: 1.39

Number of acute care hospitals with SIR >1.0 for 2020: **8 (11%)**

Black line = 2015 national baseline n = Number of reporting hospitals

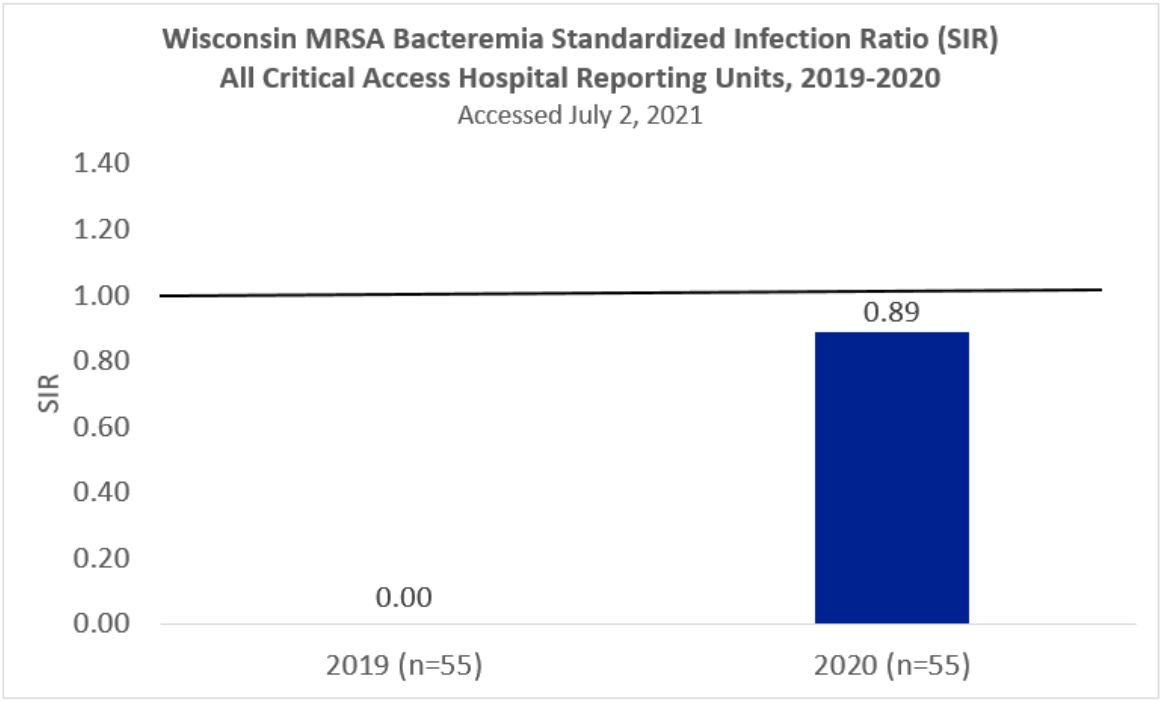
*Statistically significant difference from national baseline

Unit Type	Number of Reporting Acute Care Hospitals	Number of Infections**	2020 SIR	Confidence Interval	Percent Change from 2019–2020
All units combined	75	84	0.63*	0.50–0.77	22% increase

**Includes healthcare-onset (>3 days after admission), laboratory-identified MRSA bacteremia infections.

MRSA Bacteremia: Critical Access Hospitals:

At the national level, there was almost no change in the number of hospital-onset MRSA bacteremia events among critical access hospital patients between 2019 and 2020.[2,3] As shown in the graph below, the MRSA bacteremia SIR for critical access hospitals in Wisconsin increased from 2019 to 2000, but this was not a statistically significant increase.



No critical access hospital had enough data to calculate a facility-level SIR for the year.

10th percentile:

25th percentile:

50th percentile:

75th percentile:

90th percentile:

Number of critical access hospitals with SIR >1.0 for 2020: N/A

Black line = 2015 national baseline n = Number of reporting hospitals

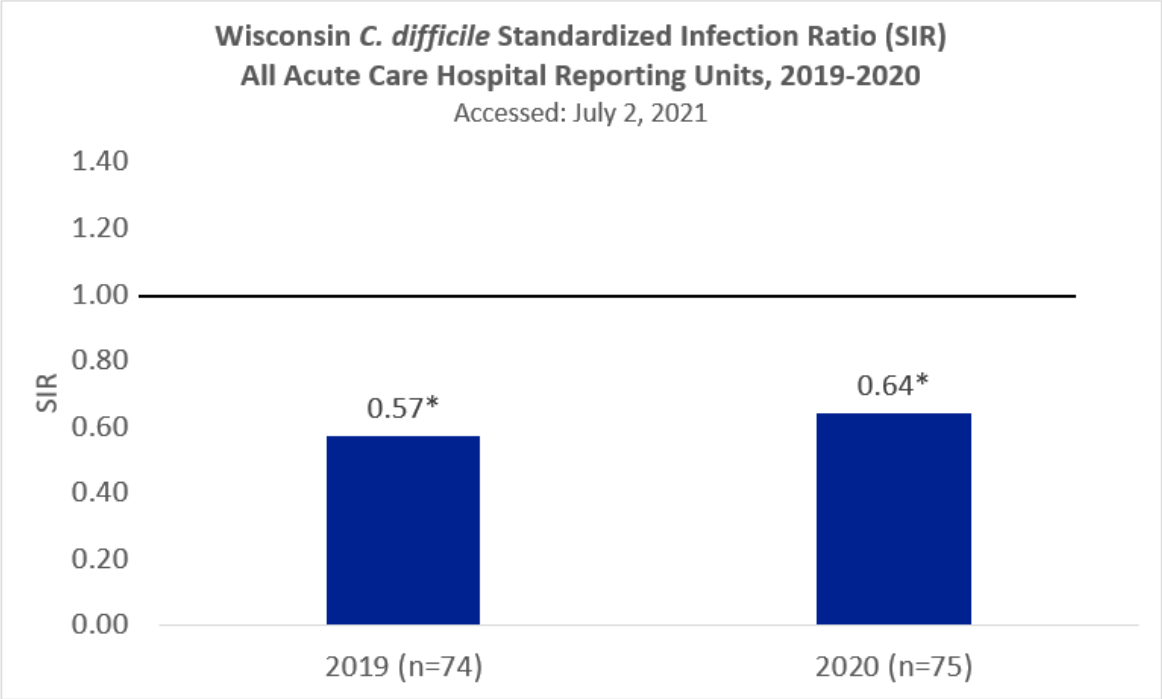
*Statistically significant difference from national baseline

Unit Type	Number of Reporting Critical Access Hospitals	Number of Infections**	2020 SIR	Confidence Interval	Percent Change from 2019–2020
All units combined	55	3	0.89	0.23–2.41	N/A

**Includes healthcare-onset (>3 days after admission), laboratory-identified MRSA bacteremia infections.

Clostridioides difficile (C. difficile): Acute Care Hospitals:

Persons at highest risk of *C. difficile* infection include older hospital patients or nursing home residents receiving prolonged antibiotic therapy. The measure shown here includes laboratory-identified *C. difficile* occurring more than three days after a hospital admission. As shown in the table, the number of *C. difficile* infections among acute care hospital patients in Wisconsin increased from 2019 to 2020, and this was a statistically significant increase. At the national level, the *C. difficile* SIR for acute care hospitals decreased by 11% from 2019 to 2020.[2]



WI Acute Care Hospital SIR Values at Key Percentiles

- 10th percentile: 0.22
- 25th percentile: 0.45
- 50th percentile: 0.58
- 75th percentile: 0.87
- 90th percentile: 0.99

Number of acute care hospitals with SIR >1.0 for 2020: **7 (9%)**

Black line = 2015 national baseline n = Number of reporting hospitals

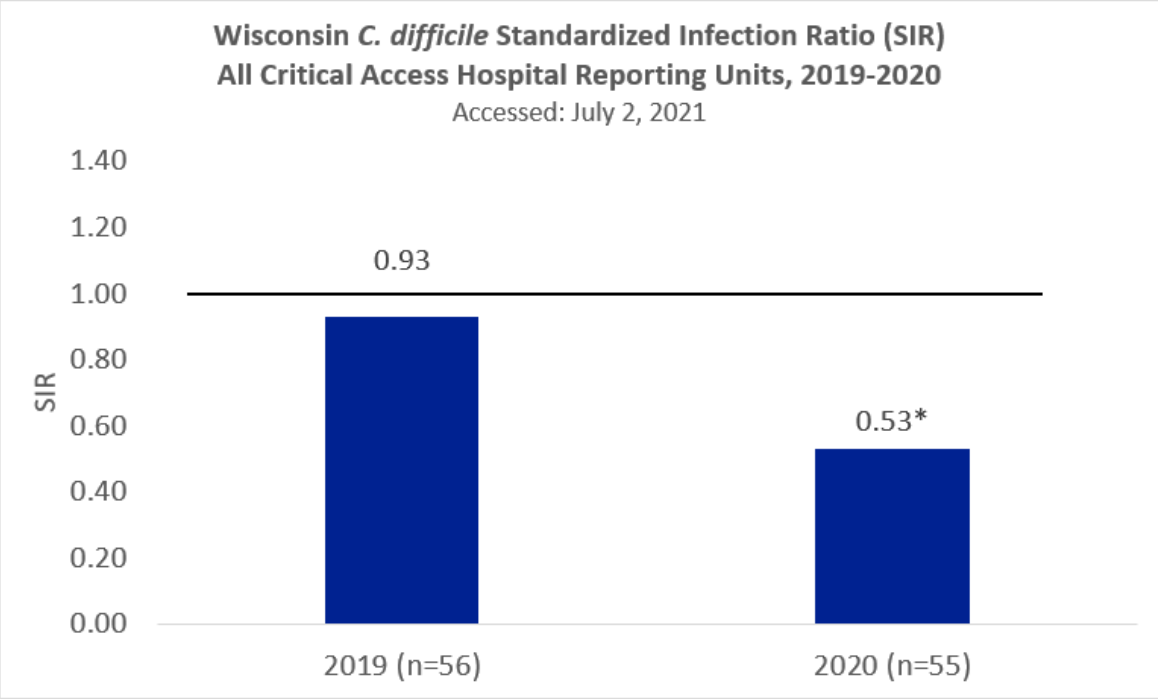
*Statistically significant difference from national baseline ^Statistically significant difference

Unit Type	Number of Reporting Acute Care Hospitals	Number of Infections**	2020 SIR	Confidence Interval	Percent Change from 2019–2020
All units combined	75	723	0.64*	0.59–0.69	12% increase^

**Includes healthcare-onset (>3 days after admission), laboratory-identified *C. difficile* infections.

C. difficile: Critical Access Hospitals:

At the national level, the *C. difficile* SIR for critical access hospitals decreased from 2019 to 2020, though the decrease was not statistically significant.[2,3] As shown below, there was a statistically significant decrease in the *C. difficile* SIR for Wisconsin critical access hospitals from 2019 to 2020.



WI Critical Access Hospital SIR Values at Key Percentiles

- 10th percentile: 0.00
- 25th percentile: 0.00
- 50th percentile: 0.22
- 75th percentile: 0.98
- 90th percentile: 1.36

Number of critical access hospitals with SIR >1.0 for 2020: **6 (11%)**

Black line = 2015 national baseline n = Number of reporting hospitals

*Statistically significant difference from national baseline ^Statistically significant difference

Unit Type	Number of Reporting Critical Access Hospitals	Number of Infections**	2020 SIR	Confidence Interval	Percent Change from 2019–2020
All units combined	55	27	0.53	0.36–0.76	43% decrease^

**Includes healthcare-onset (>3 days after admission), laboratory-identified *C. difficile* infections.

REFERENCES

1. Weiner-Lastinger, L., Pattabiraman, V., Konnor, R., Patel, P., Wong, E., Xu, S., Smith, B., Edwards, J., Dudeck, M. (2021). The impact of coronavirus disease 2019 (COVID-19) on healthcare-associated infections in 2020: A summary of data reported to the National Healthcare Safety Network. *Infection Control & Hospital Epidemiology*, 1-14. doi:10.1017/ice.2021.362. Available at: https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/impact-of-coronavirus-disease-2019-covid19-on-healthcareassociated-infections-in-2020-a-summary-of-data-reported-to-the-national-healthcare-safety-network/8197F323F4840D233A0C62F4726287E1. Accessed December 29, 2021.
2. Centers for Disease Control and Prevention. 2020 National and State Healthcare-Associated Infections Progress Report. Available at: https://www.cdc.gov/hai/data/portal/progress-report.html. Accessed December 29, 2021.
3. Centers for Disease Control and Prevention. 2019 National and State Healthcare-Associated Infections Progress Report. Available at: https://www.cdc.gov/hai/data/archive/2019-HAI-progress-report.html. Accessed December 29, 2021.