

Surgical Site Infection Rates for Colorectal Surgery Have Increased 21% Since 2019

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Key Findings:

- Colorectal surgeries consistently had the highest rate of surgical site infections (SSIs) of all surgeries studied and have seen a 21% increase in the percentage of procedures resulting in infection since Q4 2019.
- SSI rates have remained relatively stable for knee and hip replacements, cesarean sections, and abdominal hysterectomies since 2019.

Surgical site infections (SSIs) are a type of healthcare-associated infection and are associated with poorer health outcomes, extended hospital stays, and higher healthcare costs.¹ While there are a number of factors that can contribute to the likelihood of developing an SSI, identifying procedures that are most likely to result in an infection can help to tailor prevention and treatment efforts.

To better understand trends in SSIs, we studied 5,357,545 surgeries performed between January 1, 2019, and September 30, 2024, by procedure type, including colorectal surgery, cesarean section (C-section), hip replacement, knee replacement, and abdominal hysterectomy. These procedures represent the most common types of procedures with data reported to the National Healthcare Safety Net (NHSN).²

Colorectal surgeries consistently demonstrated the highest rate of SSI across the study period, as seen in Figure 1. Following a temporary decline in early 2020—possibly due to pandemic-related reductions in elective surgery volumes and enhanced infection control³—colorectal surgery infection rates returned to previous rates and then rose steadily, reaching 7.4% in Q3 2024 from 6.1% in Q4 2019.

C-sections saw a slight rise in SSI rates from 1.0% in Q2 2020 to 1.3% in Q3 2024, maintaining relatively low infection rates overall. Hysterectomy-related SSIs fluctuated more, while still having relatively low infection rates. Knee replacement infection rates remained 0.8% or less in all quarters, while hip replacement SSIs were 1.5% or less.

Surgical Site Infection Rates by Procedure Type

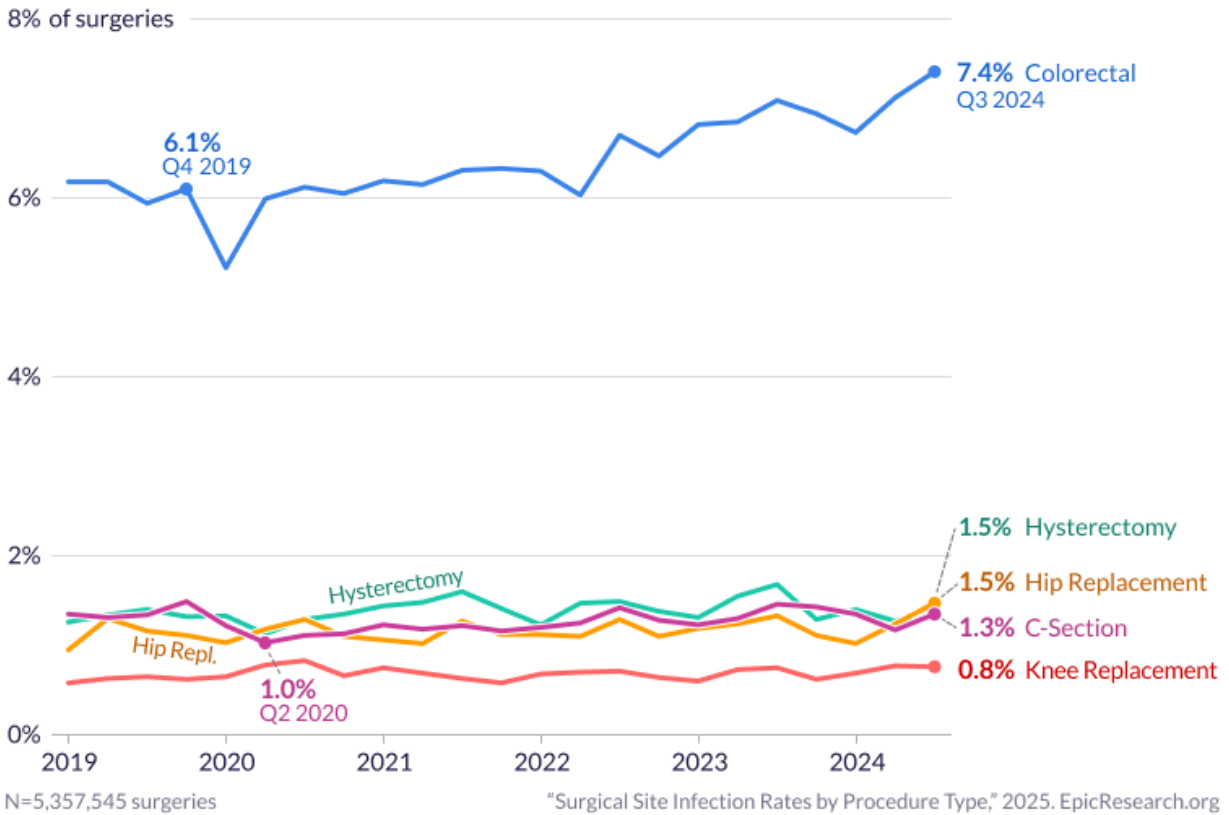


Figure 1. The rate of surgical site infections by procedure type over time.

Of note, infection preventionists manually link infections to procedures to identify them as SSIs, which could introduce variability in case identification.

These data come from Cosmos, a dataset created in collaboration with a community of Epic health systems representing more than 299 million patient records from 1,700 hospitals and more than 40,000 clinics from all 50 U.S. states, Lebanon, and Saudi Arabia. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions. Graphics by Brian Olson.

References

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Data Definitions

Term	Definition
Study period	Surgeries performed from 1/1/2019 to 9/30/2024. Surveillance for SSIs typically continues for 90 days after the surgery.
Study population	Abstracted National Healthcare Safety Network (NHSN) surgeries from organizations whose first abstracted infection occurred before 2019
Exposures	Procedures mapped to NHSN categories ⁴ at the organization Colorectal: Incision, resection, or anastomosis of the large intestine; includes large-to small and small-to-large bowel anastomosis; does not include rectal operations Cesarean section Hip replacement: Arthroplasty of hip/hip replacement Knee replacement: Arthroplasty of knee/knee replacement Abdominal hysterectomy
Outcomes	An SSI associated with the procedure

Table 1: Surgical Site Infection Rates by Procedure Type

	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4
Surgery Type	2019				2020				2021			
Colorectal	6.2%	6.2%	5.9%	6.1%	5.2%	6.0%	6.1%	6.0%	6.2%	6.1%	6.3%	6.3%
C-Section	1.3%	1.3%	1.3%	1.5%	1.2%	1.0%	1.1%	1.1%	1.2%	1.2%	1.2%	1.2%
Hip Replacement	0.9%	1.3%	1.2%	1.1%	1.0%	1.2%	1.3%	1.1%	1.1%	1.0%	1.3%	1.1%
Hysterectomy	1.3%	1.3%	1.4%	1.3%	1.3%	1.1%	1.3%	1.3%	1.4%	1.5%	1.6%	1.4%
Knee Replacement	0.6%	0.6%	0.7%	0.6%	0.6%	0.8%	0.8%	0.7%	0.8%	0.7%	0.6%	0.6%

	2022 Q1	2022 Q2	2022 Q3	2022 Q4	2023 Q1	2023 Q2	2023 Q3	2023 Q4	2024 Q1	2024 Q2	2024 Q3
Surgery Type	2022				2023				2024		
Colorectal	6.3%	6.0%	6.7%	6.5%	6.8%	6.9%	7.1%	6.9%	6.7%	7.1%	7.4%
C-Section	1.2%	1.2%	1.4%	1.3%	1.2%	1.3%	1.5%	1.4%	1.3%	1.2%	1.3%
Hip Replacement	1.1%	1.1%	1.3%	1.1%	1.2%	1.2%	1.3%	1.1%	1.0%	1.2%	1.5%
Hysterectomy	1.2%	1.5%	1.5%	1.4%	1.3%	1.5%	1.7%	1.3%	1.4%	1.3%	1.5%
Knee Replacement	0.7%	0.7%	0.7%	0.6%	0.6%	0.7%	0.8%	0.6%	0.7%	0.8%	0.8%