



# BinDoc Research Notes

Insights about Surgical Site  
Infections with Routine-Data  
from Germany in 2019  
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# ABSTRACT

Surgical site infections (SSIs) or postoperative wound infections, as one kind of nosocomial infections (NIs), are documented in Germany via the surveillance network KISS in the module 'OP-KISS', whereby participation by the hospitals is on a voluntary basis.

In a recent article, Aghdassi et al. (2021) reported the incidence and likelihood of SSIs in C-sections and open/laparoscopic colon surgeries in Germany from 2017 to 2019 for urgent and elective cases based on KISS surveillance.

Capturing nosocomial infections based on clinical criteria and pathogens from patients' records in a system like the KISS in Germany (or CNC/NHSN in the US) has been the gold standard of NI surveillance. However, maintaining such a surveillance system is time and cost intensive.

An alternative could be the use of routine data (for reimbursement purposes) which is assembled by all clinics on all patients mandatorily. Routine data, however, were never meant to provide a complete picture of nosocomial infections, and it remains controversial if it is possible to approximate clinical criteria of NI detection via ICD-10 codes in the DRG-system.

## Key Findings

Our SSI rates are partly a bit lower than those reported in Aghdassi et al., the differences are generally small and the substantial findings are similar.

This indicates that, while routine data (reimbursement data) might slightly underreport SSIs, the results are similar like those of KISS surveillance, and reimbursement-data seem well-suited for drawing substantial conclusions about the incidence and differences in SSIs in different surgical procedures.



In this report, we use a sample of routine data from the BinDoc database from 2019 covering about 10 percent of German clinics/patients.

In a first step, we constrain our data to a subsample of patients with C-sections (**OPS codes 5-740, 5-741, 5-742, 5-749**) or colon surgeries (**OPS codes 5-455, 5-456.0**) as the main procedure, and we further differentiate the latter for whether they were open or laparoscopic surgeries, in the same way the KISS is doing it.

We also distinguish patients for urgent versus elective admission. Different than Aghdassi et al., we use ICD-10 codes **T81.4, T80.2, T83.5, T87.4, and O86.0** to capture surgical site infections (SSIs), but similar to them, we also track patients for a period of 30 days via their hashed insurance ID which is available for about 90 percent of the patients in our data.

Applying a time window of about 30 days is crucial, as SSIs do not necessarily develop during the hospital stay with the C-section or colon surgery, but often thereafter so that patients re-enter either the same or another clinic.

We closely follow the analyses by Aghdassi et al. (2021), report the incidence of SSIs in patients with C-sections or colon surgeries within a 30-day time frame, and compare our results with their findings to determine whether DRG-/routine data provide similar results like KISS data.



Overall, we have **23.752 patients with a C-section** or colon surgery in 2019 in our data (06/2022), of which **18.711 (79%) had C-sections** and **5042 (21%) had colon surgeries** (Aghdassi: 67.7%, 32.3%), whereby **2785 (55%) of the colon surgeries were open** and **2185 (43%) were laparoscopic** (Aghdassi: 61.7%, 38.3%).

Of the 23.752 patients with either C-sections or colon surgeries, **16.077 (68%) were elective** and **7392 (31%) were urgent** (Aghdassi: 61%, 26%).

The SSI-rate per 100 patients in 2019 was **0.84** (Aghdassi: 0.98 [0.85; 1.11]) in urgent C-sections, and **0.49** (Aghdassi: 0.46 [0.40; 0.53]) in elective C-sections.

In open colon surgeries, the rate was **8.9** in urgent and **6.8** in elective cases (Aghdassi: 9.66 [8.89; 10.49], 8.60 [8.13; 9.11]). In laparoscopic colon surgeries, the rate was **2.4** in urgent and **2.6** in elective cases (Aghdassi: 4.96 [3.37; 6.47], 5.16 [4.76; 5.58]).

Thus, we see that **our SSI-rates are similar to those reported by Aghdassi et al.** in C-sections and urgent open colon surgeries, and that **they are lower in elective open colon surgeries and laparoscopic colon surgeries.**

However, it is important to bear in mind that Aghdassi looked at 2017-2019, while we only observe 2019, and **rates have probably decreased over the years.** Additionally, we can only track patients' SSIs in hospitals that appear in our database.





That said, although our SSI rates are partly a bit lower than those reported in Aghdassi et al., the **differences are generally small** and the substantial findings are similar: C-sections have much lower SSI-rates than colon surgeries, open colon surgeries have higher SSI-rates than laparoscopic colon surgeries, and the difference of SSI-rates in urgent and elective cases shows up in C-sections and open colon surgeries, but not in laparoscopic surgeries (see Aghdassi et al. 2021 for the same conclusions).

This indicates that, while the DRG-system might slightly **underreport SSIs**, the results are similar like those of KISS surveillance, and DRG-data seem well-suited for drawing substantial conclusions about the incidence and differences in SSIs in different surgical procedures.

Finally, we extend our analysis to the period from 2019 to 2021 (same clinics). Now, we have 67.482 patients with a C-section or colon surgery, of which 53.480 (79%) had a C-section and 14.004 (21%) a colon surgery (7584 or 54% open, and 6260 or 45% laparoscopic). 45.316 (67%) of the cases were elective, and 21.553 (32%) of the cases were urgent. Thus, **the percentages are very similar to the year 2019 only**.

As for the SSI-rate per 100 patients from 2019 to 2021, it was 0.78 for urgent and 0.45 for elective C-sections, and 8.7 for urgent and 7.1 for elective open colon surgeries, and 3.1 for urgent and 2.4 for elective laparoscopic colon surgeries, and thus, **very similar to the numbers from 2019, too**.

# REFERENCE

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S J S Aghdassi, C Schröder, P Gastmeier (2021): Urgency of surgery as an indicator for the occurrence of surgical site infections: data from over 100,000 surgical procedures;  
<https://pubmed.ncbi.nlm.nih.gov/33422591/>; J Hosp Infect . 2021 Apr; 110:1-6

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