

Risk factors for surgical site infection after total joint arthroplasty: data from the Swiss national surveillance system

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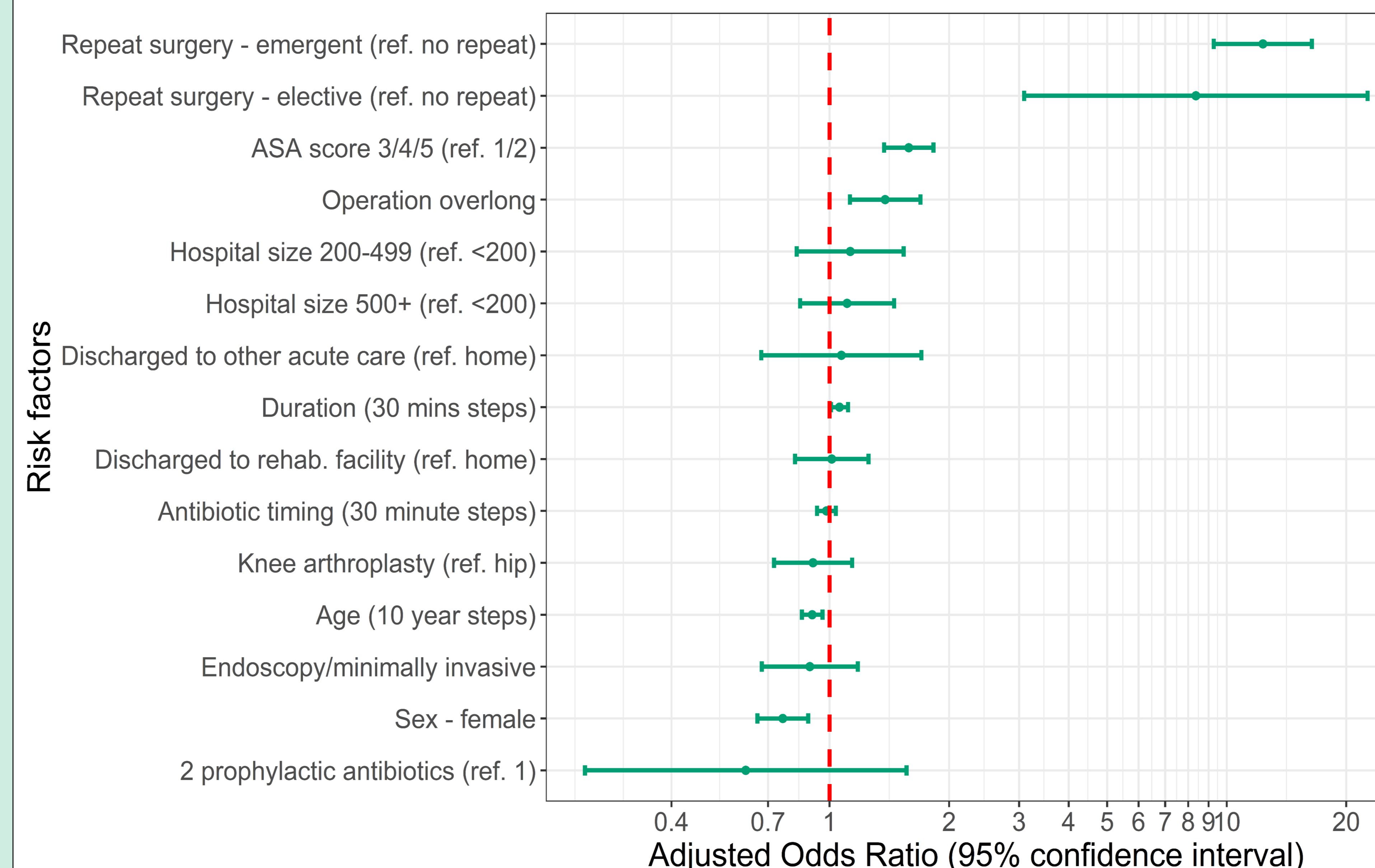
Background

- Surgical site infections (SSIs) are infrequently observed after total joint arthroplasty but have devastating consequences.
- Most Swiss hospitals participate in the national SSI surveillance, *Swissnosc*.
- The aim of this observational cohort study was to identify risk factors of SSI among elective hip and knee arthroplastic procedures, and to describe incidence of SSI during the follow-up period.

Methods

- We performed an analysis of SSI from prospectively collected data with procedural characteristics and risk categories.
- Risk factors for SSI were identified using both univariate and multivariate logistic regression.
- Models were adjusted for hospital level correlation effects and for possible censoring bias using inverse probability weighting.

Figure 2: Risk factors for SSI following arthroplasty



Results

- We analyzed a total of 113'495 procedures that occurred between June 2009 and September 2017 (Figure 1).
- Follow-up was 92.5% 12 months after surgery.
- Overall SSI rate was 1.3%
 - 1% for knee
 - 1.4% for hip arthroplasty.
- Repeat surgery (unplanned or planned), higher ASA level, and longer than anticipated procedural time were associated with a significantly increased risk of infection in multivariate analyses (Figure 2).
- 91% of all SSIs (n=1'328) were detected after discharge.
- Risk factors for pre-discharge SSIs were very similar to those mentioned above (data not shown).
- Fifty-six percent of SSIs were observed within 30 days, 27% from 30-90 days after incision and 17% were observed >90 days after the procedure (Figure 3).

Figure 1: Observational data included in the study

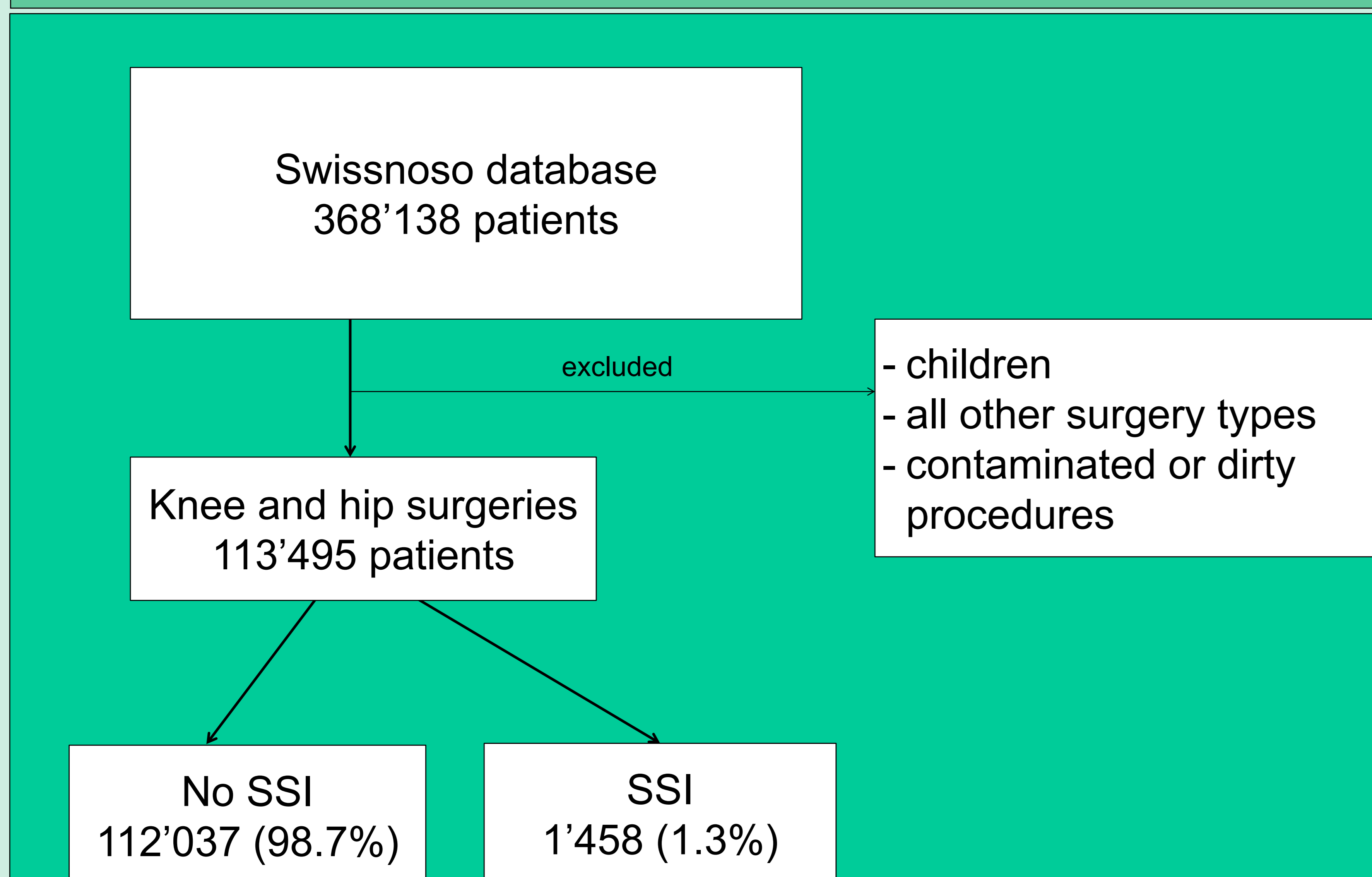
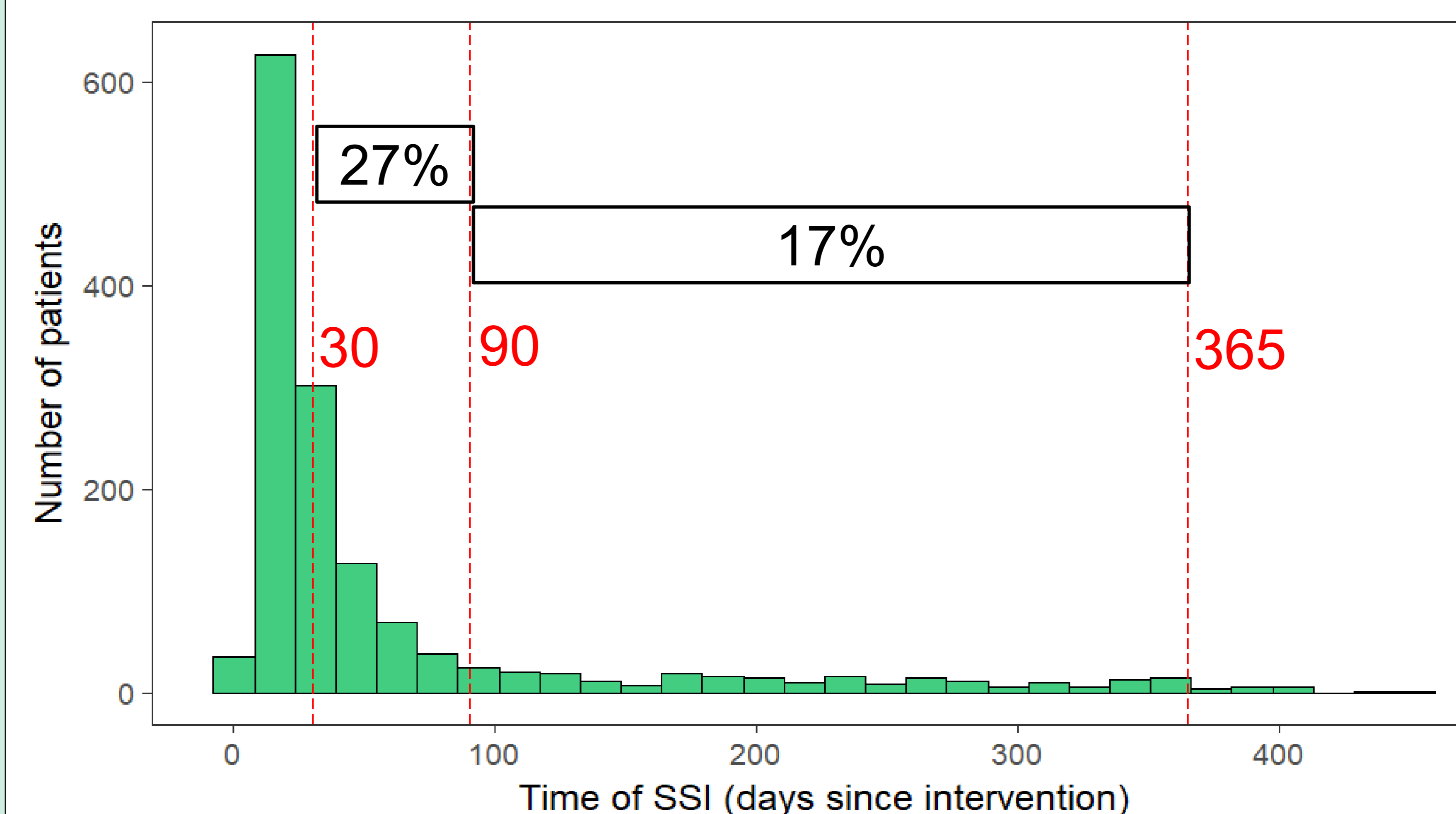


Figure 3: Detection of SSIs during follow-up



Conclusions

- The SSI incidence after total joint arthroplasty was low.
- Almost all SSIs occurred post-discharge, with risk factors being broadly the same, independent of when the infection occurred.
- Limiting the follow-up period to 30 days would have resulted in missing 44% of SSIs. A follow-up period of 90 days would have missed 17% of SSIs. This argues in favor of extended follow-up.

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References: 1. Centers for Disease Control and Prevention (CDC)/National Healthcare Safety Network (NHSN). Surgical site infection (SSI) event. Procedure-associated module SSI. Jan 2015. Atlanta, GA: CDC. [Accessed 5 Feb 2015]. Available from: <http://www.cdc.gov/nhsn/PDFs/pscManual/9pscSSICurrent.pdf>, 2. M B Koek *et al.* Eurosurveillance. Post-discharge surveillance (PDS) for surgical site infections: a good method is more important than a long duration, 3. DK Deborah *et al.* CID. Reporting Surgical Site Infections Following Total Hip and Knee Arthroplasty: Impact of Limiting Surveillance to the Operative Hospital, 4. Lenguerand *et al.* Lancet ID, Risk factors associated with revision for prosthetic joint infection after hip replacement: a prospective observational cohort study