AUDIT AND FEEDBACK STRATEGIES AND CHANGES IN DEFINITION OF SURVEILLANCE IN POST-ARTHROPLASTY SURGICAL SITE INFECTIONS: 15-YEAR INTERRUPTED TIME SERIES ANALYSIS

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INTRODUCTION

Surgical site infection (SSI) surveillance is essential; analysis of SSI time series can provide insights into the effects of ecological intervention measures and changes in SSI definitions.

In 2017, the CDC shortened post-implant SSI surveillance from 1 year to 3 months.

OBJECTIVE

Evaluate long-term SSI trends after knee and hip arthroplasty, including the impact of the CDC´s SSI definition change, and compare the effects of different individual surgeon-feedback strategies.

CONCLUSIONS

Synchronous in-person feedback was associated with a sustained reduction in SSI trends, whereas the long-term effect of asynchronous electronic feedback remained inconclusive.

The surveillance-definition change was not associated with an immediate change in SSI rates.

As an ecological study, the influence of concurrent changes in baseline infection risk, co-interventions, and other unmeasured factors cannot be excluded.

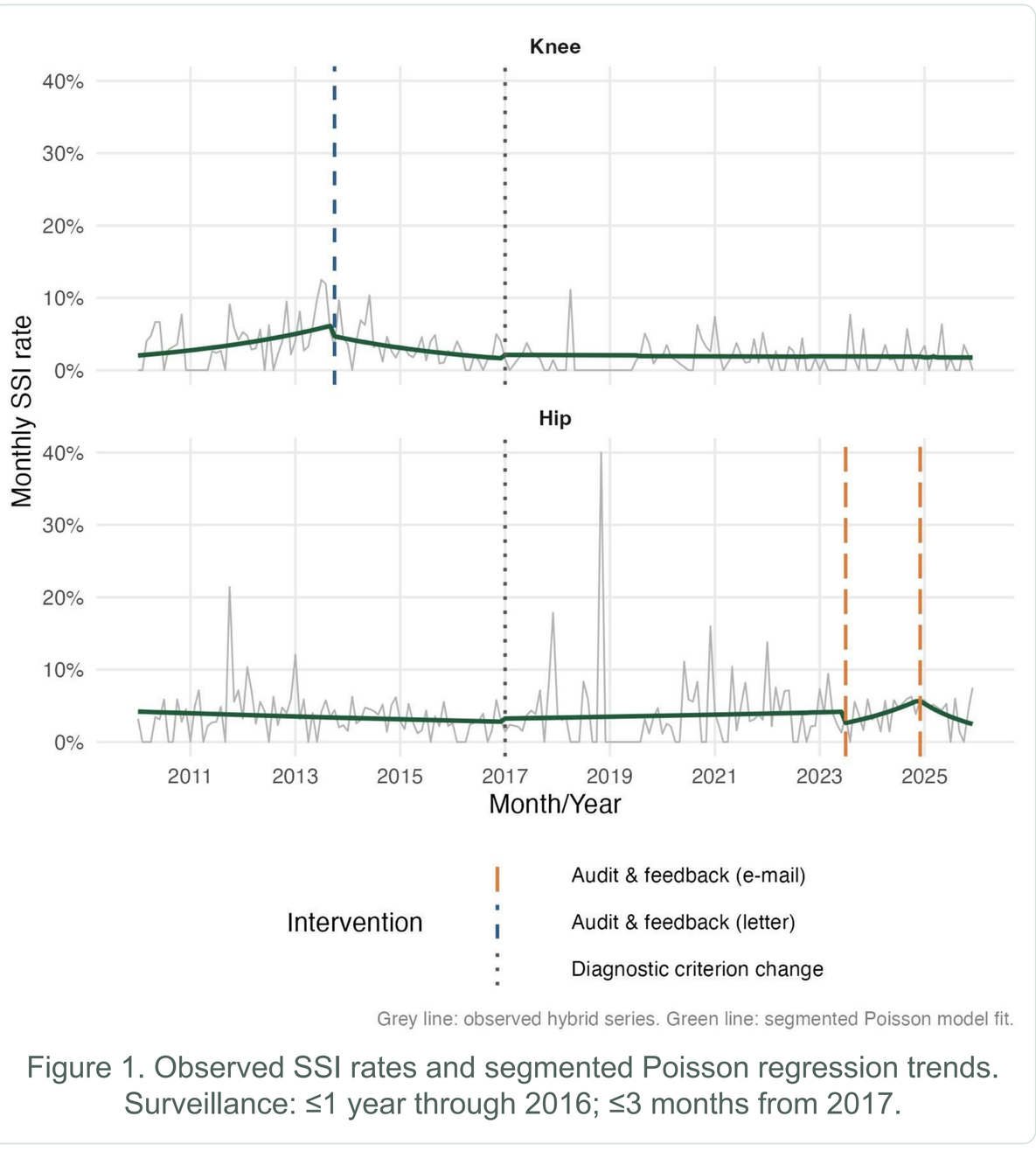
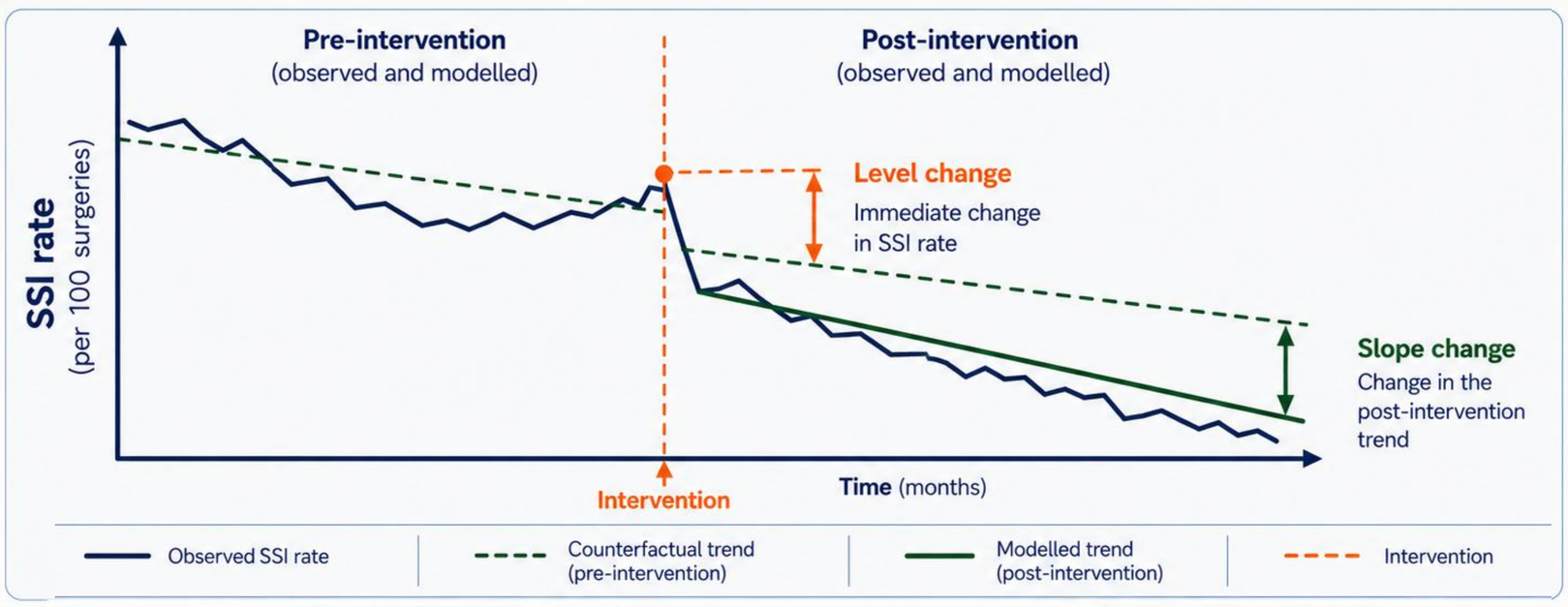


Figure 1. Observed SSI rates and segmented Poisson regression trends. Surveillance: ≤1 year through 2016; ≤3 months from 2017.

METHODS

Interrupted time series analysis (ITSA)

How the model works in this study



Design and population

Monthly SSI rates after primary arthroplasty:
- Total knee arthroplasty (**TKA**)
- Total hip arthroplasty **(THA)**

Period:
January 2010 – December 2025

Statistical analysis

- ✓ Segmented Poisson interrupted time series analysis (ITSA), adjusted for monthly surgical volume, estimated level and slope changes in SSI rates following each intervention.
- ✓ The 2017 surveillance-definition change was modeled as a **structural break**.

Interventions

TKA (in-person + printed)
- In-person lecture
- Simultaneous delivery of printed individual reports

THA (asynchronous email)
- In-person lecture
- Individual rates emailed asynchronously

RESULTS

TKA: IN-PERSON PRINTED FEEDBACK

RR 0.95 (95% CI 0.92–0.98)

per month · p < 0.001 (slope change)

Sustained reduction after a pre-intervention increase. No significant level change.

THA: FIRST ELECTRONIC FEEDBACK

RR 1.05 (95% CI 1.01–1.08)

per month · p = 0.006 (slope change)

Increasing rates after a significant downward level change: RR 0.63 (95% CI 0.40–1.00)

THA: SECOND ELECTRONIC FEEDBACK

RR 0.90 (95% CI 0.81–0.97)

per month · p = 0.012 (slope change)

No significant level change.

Post-intervention downward trend may have been influenced by concurrent prevention measures, including a decolonization protocol introduced in April 2025.

2017 SURVEILLANCE DEFINITION CHANGE

NO SIGNIFICANT EFFECT

	Level change - RR (95% CI)
TKA	1.32 (0.67–2.63)
THA	1.16 (0.67–2.02)

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KEYWORDS: Surgical site infection · Arthroplasty · Infection control