

Impact of a Targeted Methicillin-resistant *Staphylococcus aureus* Decolonization Strategy on Hospital-onset MRSA Infections

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BACKGROUND

Methicillin-resistant *Staphylococcus aureus* (MRSA) infections are a source of morbidity and mortality for hospitalized patients. While a universal MRSA decolonization approach is considered more effective than active surveillance and decolonization of MRSA-colonized patients in the intensive care unit (ICU) setting, a majority of MRSA bloodstream infections (BSI) at our hospital occur outside the ICU, leading us to develop a targeted decolonization program.

PURPOSE

The objective of this study was to evaluate the impact of this strategy on hospital-onset (HO) MRSA infections.

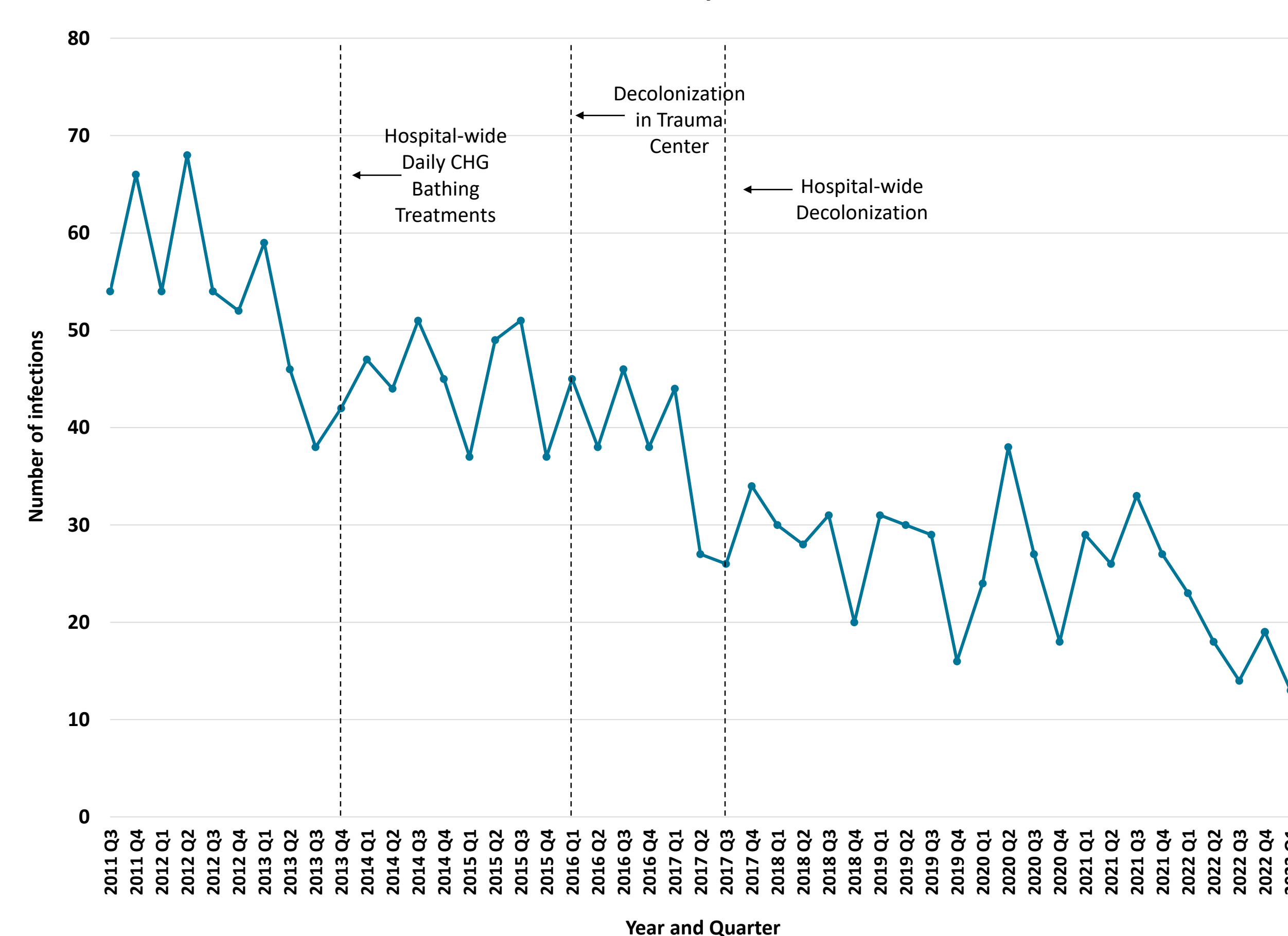
METHODS

House-wide targeted MRSA decolonization began at our 800-bed tertiary care hospital in quarter 3 of 2017, following a pilot in our Trauma units. Infection Preventionists (IP) used electronic medical record (EMR) indicators and custom lists to actively identify MRSA-colonized patients and place orders for 2% intranasal mupirocin twice daily for 5 days, through an approved MRSA decolonization protocol. All patients at our hospital also receive daily chlorhexidine gluconate bathing treatments. The primary outcome was HO-MRSA clinical infections defined as a positive MRSA clinical culture obtained \geq day 4 of admission. The secondary outcome was HO-MRSA BSI defined as a positive MRSA blood culture \geq day 4 of admission. HO-MSSA clinical infections were assessed as a non-equivalent dependent variable. We compared quarterly HO-MRSA clinical infections and HO-MRSA BSI incidence per 10,000 patient-days for the pre-intervention (July 2011-June 2017) and post-intervention (July 2017- March 2023) periods. Student's t-test was used to compare the mean quarterly incidence pre- and post-intervention; $p < 0.05$ was considered significant.

RESULTS

Hospital-onset MRSA Clinical Infections Over Time

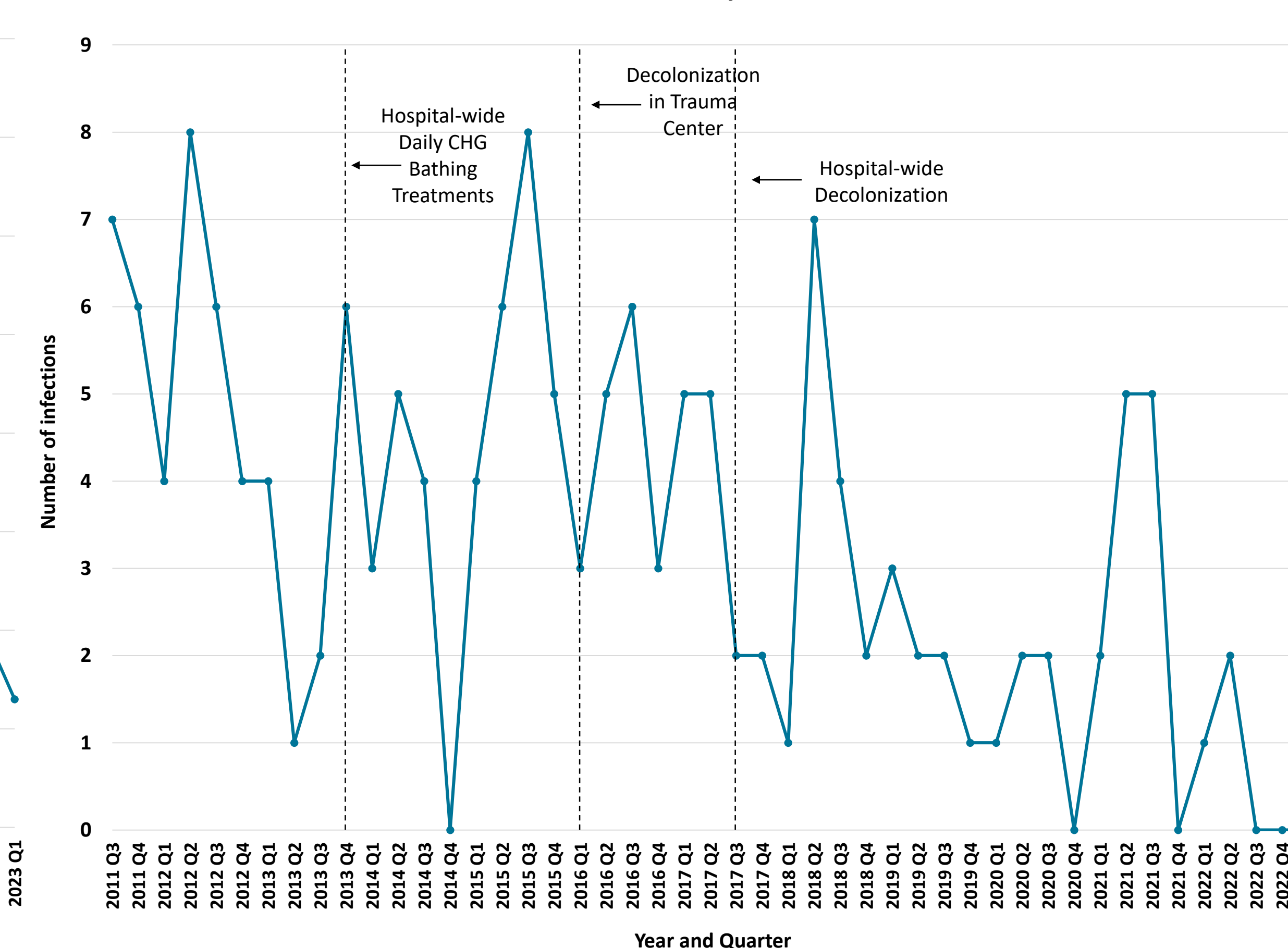
HO-MRSA clinical infection defined as MRSA clinical culture \geq day 4 of admission.



HO-MRSA clinical infections decreased from 9.2 to 4.9 per 10,000 patient-days ($p < 0.00001$).

Hospital-onset MRSA BSI Over Time

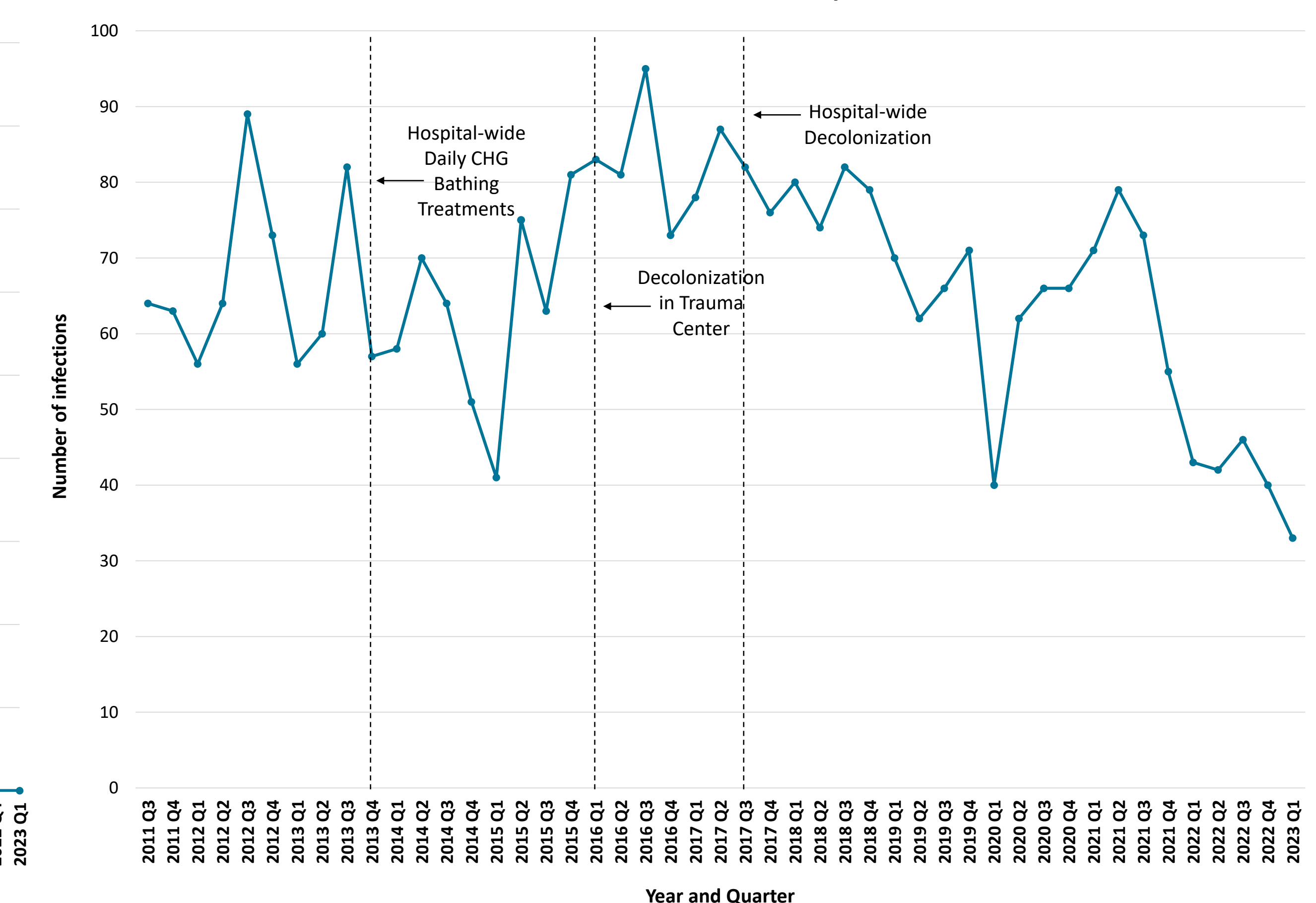
HO-MRSA BSI defined as MRSA blood culture \geq day 4 of admission.



HO-MRSA BSIs declined from 0.89 to 0.32 per 10,000 patient days ($p < 0.00001$).

Hospital-onset MSSA Clinical Infections Over Time

HO-MSSA clinical infection defined as MSSA clinical culture \geq day 4 of admission.



HO-MSSA clinical infections decreased from 13.5 to 12.3 per 10,000 patient-days however this was not significant ($p = 0.067$).

CONCLUSIONS

- An IP-led, targeted MRSA decolonization strategy leveraging the EMR to identify patients and place mupirocin orders was successful in significantly reducing HO-MRSA infections including BSI at a large academic medical center.
- There was a smaller decrease in MSSA infections in the same time period, supporting the impact of mupirocin which was directed only towards MRSA-colonized patients.
- Targeted MRSA decolonization leveraging the EMR should be considered in settings with high burden of MRSA outside the ICU.

NEXT STEPS

- Develop a MRSA Decolonization EMR Dashboard to enable IPs to:
 - easily track decolonization rates and outcomes
 - better understand MRSA decolonization failures.
- Include MRSA decolonization compliance data with daily CHG bathing treatment data already shared regularly with unit leadership.
- Consider which units may benefit from a more universal MRSA decolonization approach.

REFERENCES

- Huang, SS, Platt, R, Septimus, E, et al. Universal ICU Decolonization: An Enhanced Protocol. 2013, September. Agency for Healthcare Research and Quality. Retrieved from <https://www.ahrq.gov/hai/universal-icu-decolonization/universal-icu-ape4.html>
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