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# Practice Variations in Sedated Echocardiography and Impact on Repeat Echocardiography in Non-Refractory Kawasaki Disease

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## Importance

- Sedated echocardiography (SE) is recommended by the American Heart Association 2017 Kawasaki disease (KD) guidelines for children <36 months of age to facilitate quality imaging.<sup>1</sup>
- Practice variations in obtaining SE and its impact on repeat echocardiography (echo) in non-refractory KD (NRKD) are unknown.

## Objectives

- Primary:** To describe hospital-level variability in the percent of SE among children <36 months of age admitted with NRKD prior to the 2017 KD guideline update.
- Secondary:** To test the association of initial SE with the performance of repeat echos, length of stay (LOS), and total standardized costs.

## Methods

- Retrospective cohort study using the Pediatric Health Information System.
- Inclusion Criteria:** Children <36 months of age admitted with NRKD from 3/2010 through 2/2017 who received at least 1 echo, only 1 dose of IVIG, and no immunosuppressive medications.
- Exclusion Criteria:** KD admissions within prior 6 months, transfers-in, readmissions within 7 days where IVIG or immunosuppressive medication was billed, and hospitals with ≤10 NRKD admissions.
- Primary Outcome:** Percent of admissions with both echo and sedation medication billed on the same day.
- Secondary Outcomes:** Repeat echo during the same admission, LOS, and total hospitalization costs.
- Chi-square tests, Wilcoxon rank sum tests, and Pearson correlations were utilized; p<0.05 considered significant.

## Results

Sedated Echocardiography in Non-Refractory Kawasaki Disease

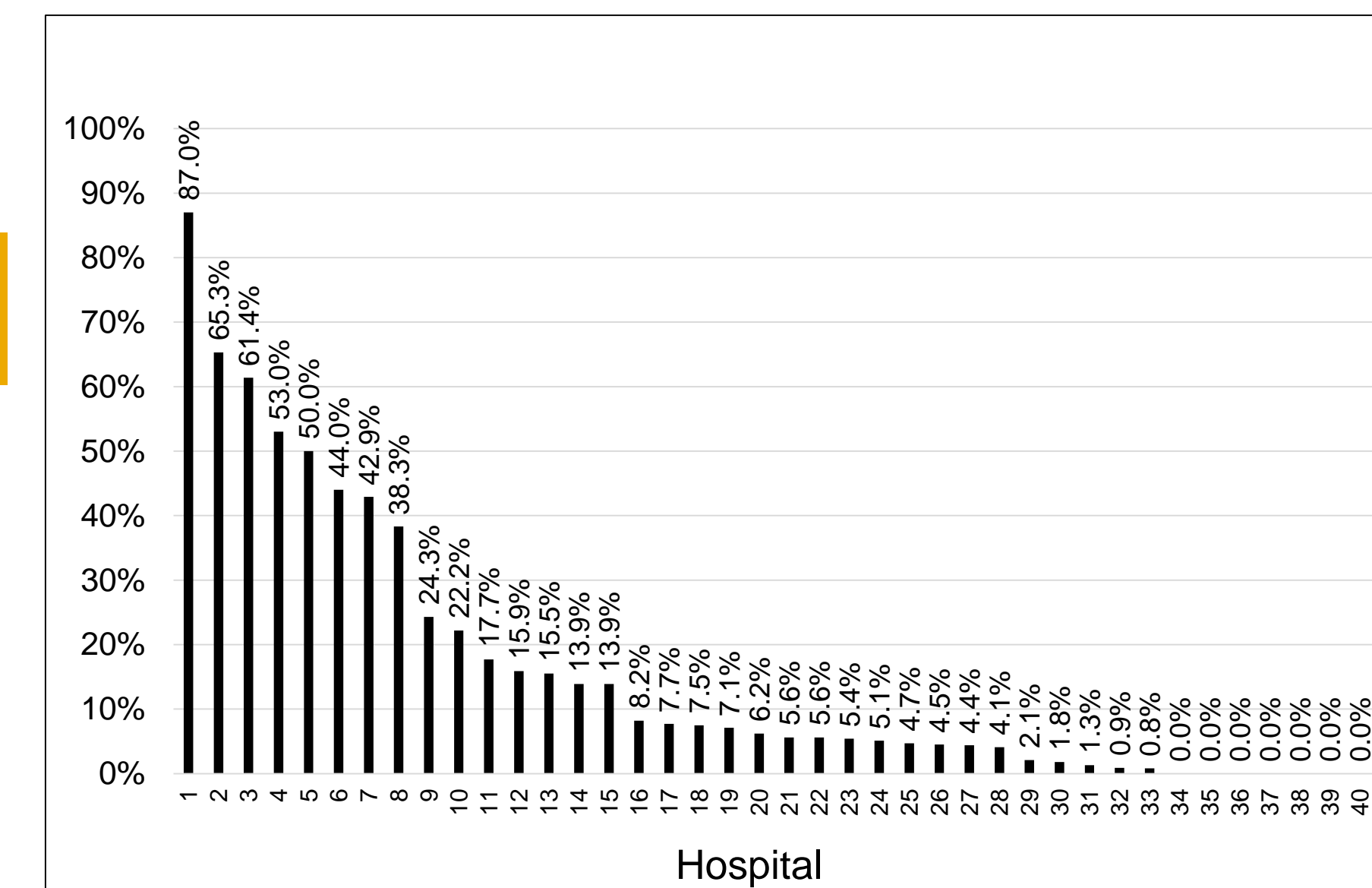


Figure 1. Percent of echos in NRKD obtained in conjunction with sedation, per hospital.

Sedated Echocardiography and Repeat Echocardiography

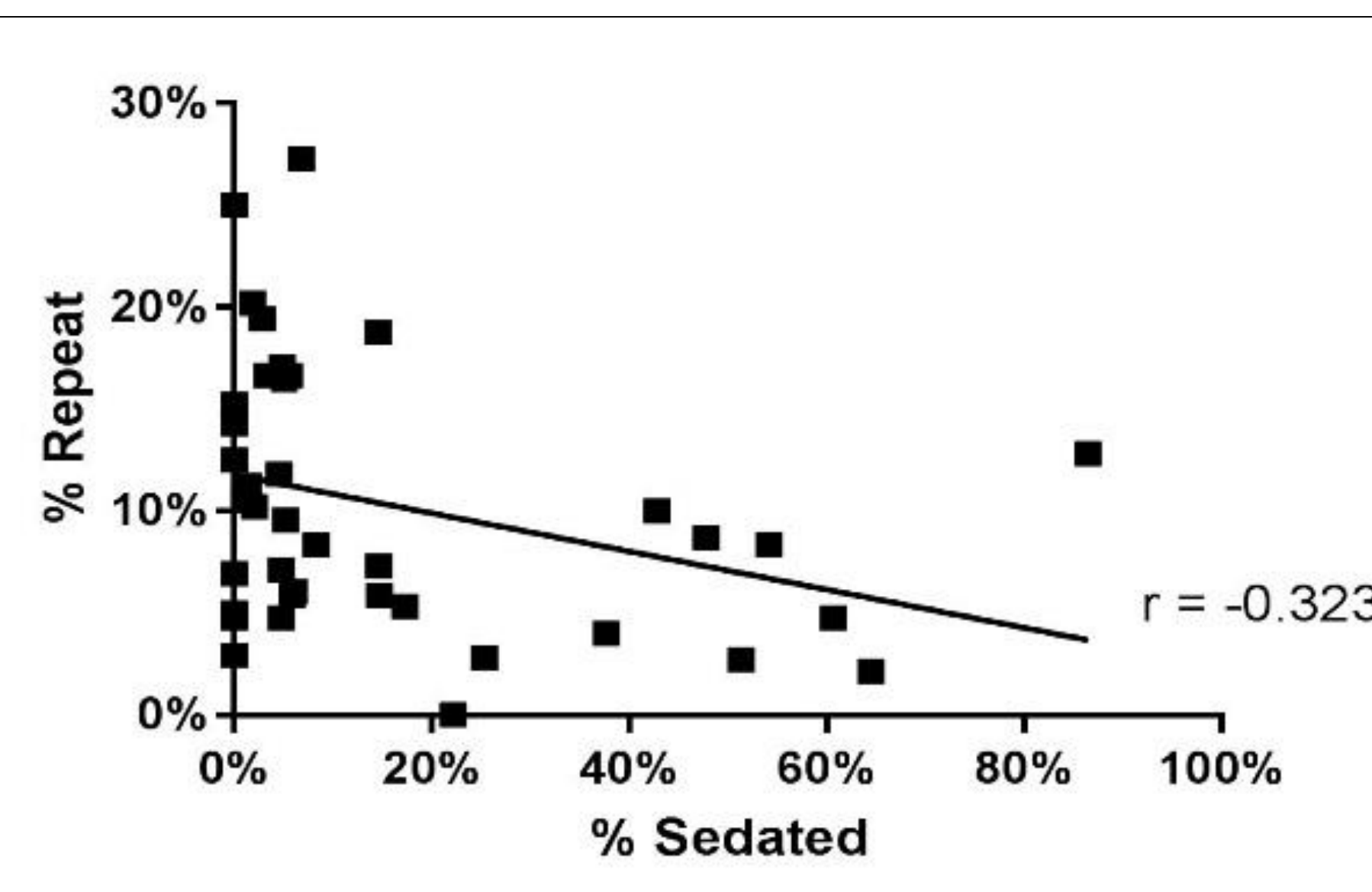


Figure 2. Hospital-level correlation of percent SE and percent repeat echo during the same hospitalization,  $r = -0.323$  (95% CI -0.576 to -0.0123),  $p = 0.042$ .

Sedated Echocardiography and Mean Length of Stay

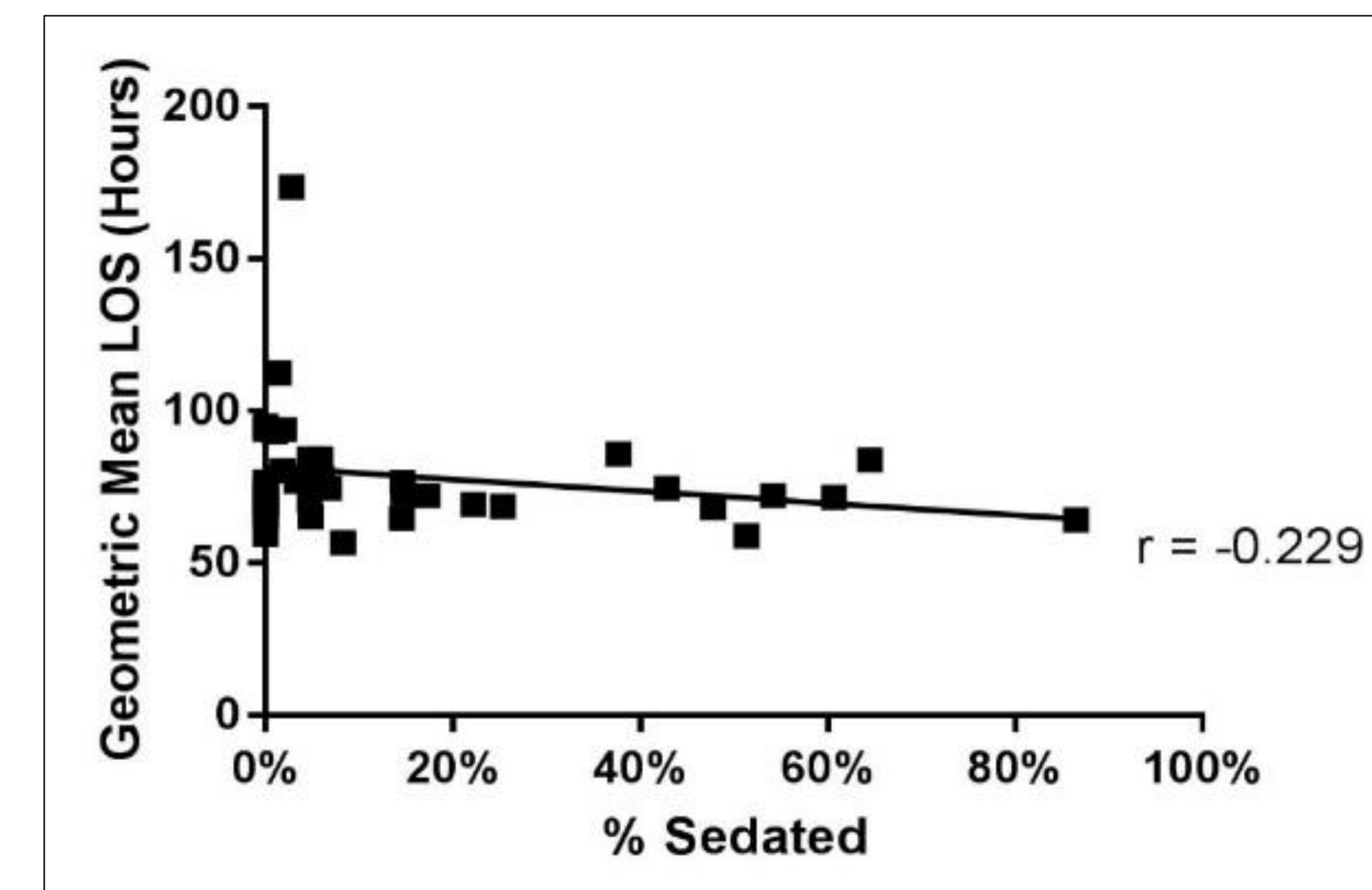


Figure 3. Hospital-level correlation of percent SE and geometric mean LOS in hours,  $r = -0.229$  (95% CI -0.504 to 0.089),  $p = 0.156$ .

Sedated Echocardiography and Total Costs

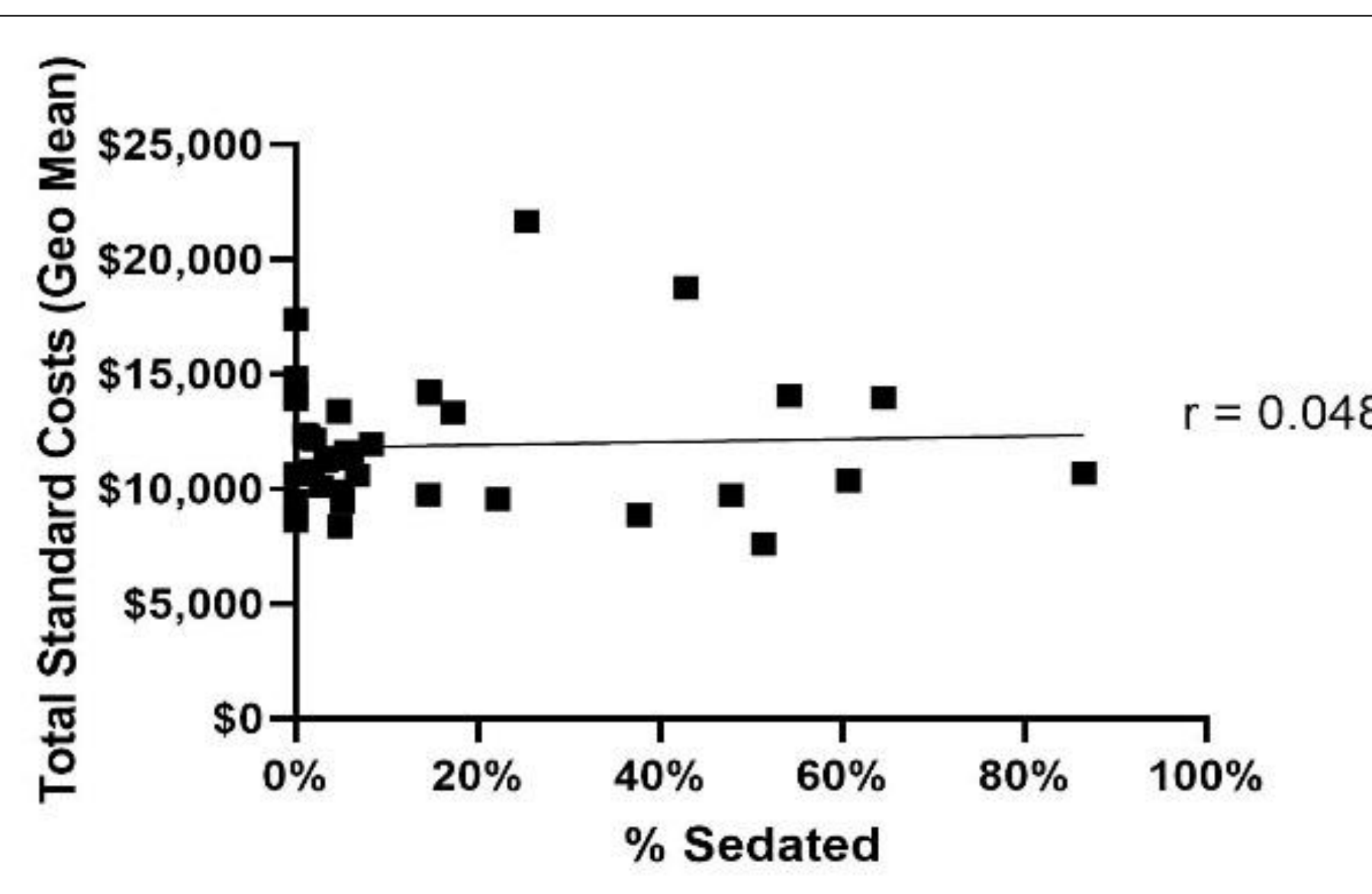


Figure 4. Hospital-level correlation of percent SE and geometric mean total standardized hospitalization costs inflated to 2017 US dollars,  $r = 0.048$  (95% CI -0.267 to 0.354),  $p = 0.768$ .

## Results

- 40 children's hospitals; 2887 NRKD admissions; 3216 total echos.
- Percent SE varied from 0% to 87% (median 5.9%, IQR 1.4% to 21.1%, Fig 1).
- 22.4% of initial echos were sedated; 10.1% of all admissions had a repeat echo.
- Hospital-level SE was associated with a lower likelihood for repeat echo (Fig 2).
- Higher NRKD volume was associated with SE,  $r = 0.406$  (95% CI 0.08 to 0.637),  $p = 0.009$ .
- No association between SE and hospital mean LOS (Fig 3) or mean total standardized costs (Fig 4).

## Limitations

- Retrospective cohort study reliant upon accurate administrative and billing data.
- Hospital-level data limits generalizability to individual patients.
- Variables other than SE may be associated with repeat echo.

## Conclusions and Relevance

- Significant variation between children's hospitals exists in the use of SE for children <36 months of age with NRKD prior to the American Heart Association 2017 KD guideline update.
- Consideration should be given to performing SE as it may reduce the need for repeat echos without impacting LOS or total costs.

## Reference

- McCrindle BW, Rowley AH, Newburger JW, et al. Diagnosis, treatment, and long-term management of Kawasaki disease: a scientific statement for health professionals from the American heart association. *Circulation*. 2017;135(17):e927–e999.

## Contact Information

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