Does Experience Pay Off? The Impact of Institutional Volume on TAVR Outcomes

Priya Joshi, BS, Karan Patel, BS, Ang Sun, PhD, Huaqing Zhao, PhD, Nicole Patlakh, MBA, David Fiss, Ravishankar Raman, MD, Brian O'Murchu, MD, and Suyog Mokashi, MD, MBA

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Disclosure of Relevant Financial Relationships

The authors have no financial relationships to disclose.

Background

- Prior studies have shown a *consistent association* between higher institutional procedural volumes and improved clinical outcomes.
- Increased congenital cardiac surgery volume has been shown to be associated with improved mortality and reduced hospitalization stay and 30-day readmissions (Williamson et. al 2022).
- In neurosurgery, higher hospital volume was correlated with improved mortality, lower complication rates, decreased length of stay and hospital charges, and favorable discharge disposition (Davies et. al 2014).

Study Aims

1. To evaluate the relationship between institutional TAVR volume and key patient outcomes
2. To identify which clinical metrics are most sensitive to volume variation

Methods

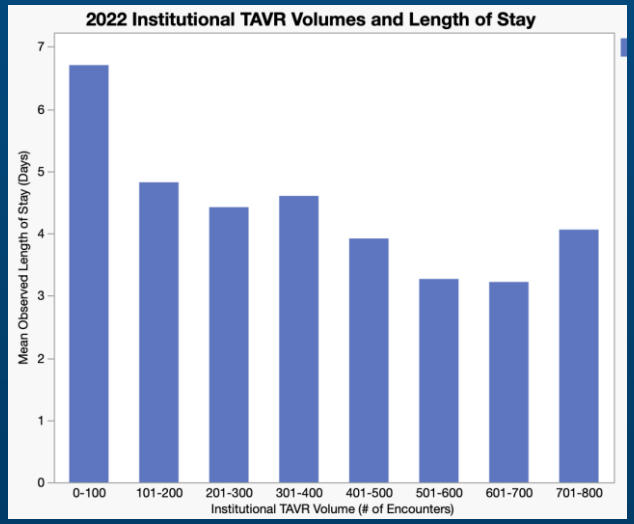
- Analysis of 91,494 TAVR procedures performed at 118 U.S. hospitals using the Vizient® Clinical Data Base
- Total Cohort sizes: 28,077 (2022), 30,602 (2023), 32,815 (2024)
- Annual case volume (e.g., 1–100 through 801–900) were used to stratify institutions into categories
- Key outcomes: mean length of stay (LOS), mean ICU stay, observed mortality, in-hospital stroke rate, complication rate, and 30-day readmission rate
- ANOVA and ANCOVA to adjust for case mix index (CMI)

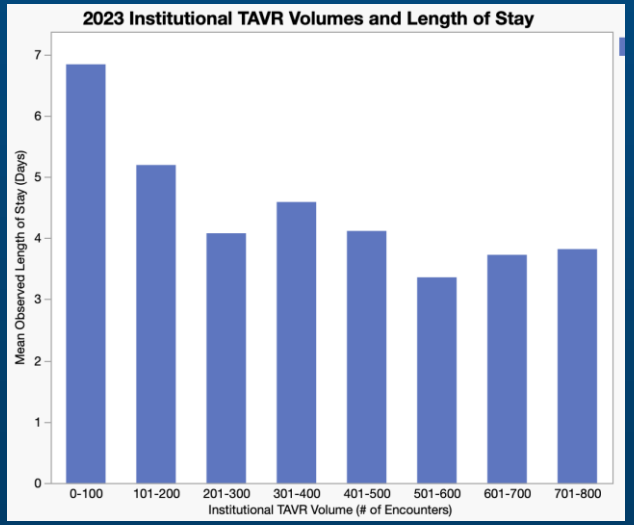
Demographics of Institutional Volume Cohorts

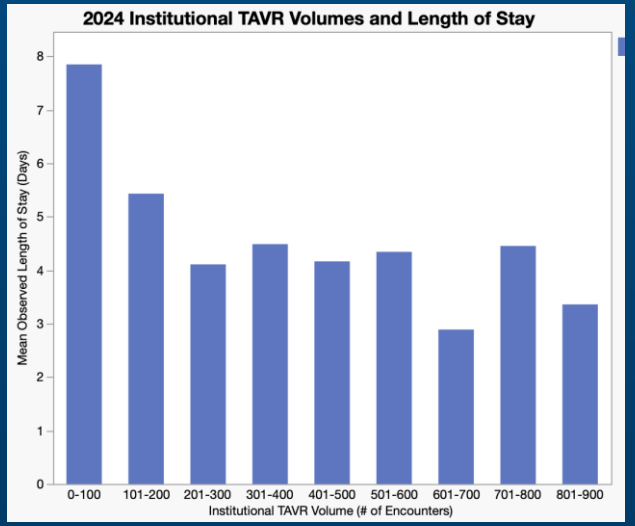
	1-100	101-200	201-300	301-400	401-500	501-600	601-700	701-800	*p*-value
Females	41%	41%	42%	43%	43%	43%	46%	40%	0.8452
Males	59%	59%	58%	57%	57%	57%	54%	60%	0.8452
Age	71	74	75	76	77	76	78	76	<0.0001
CMI	4.86	5.56	5.43	5.70	5.57	5.72	5.26	6.14	<0.0001

- Similar trends were noted in 2023 and 2024 – significantly higher CMI at the highest volume institutions

Total Hospital LOS

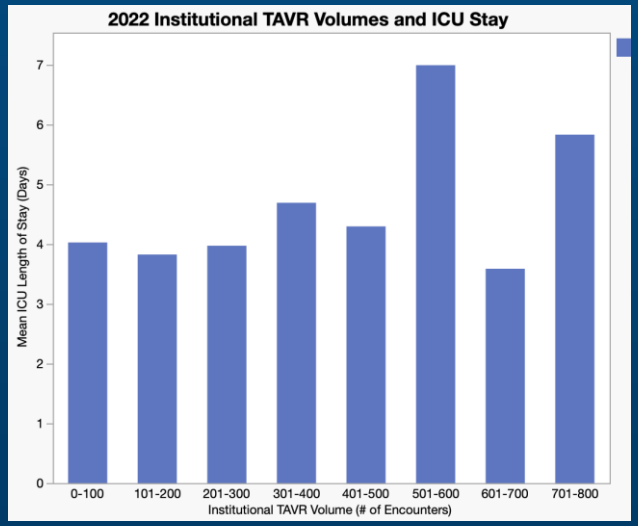


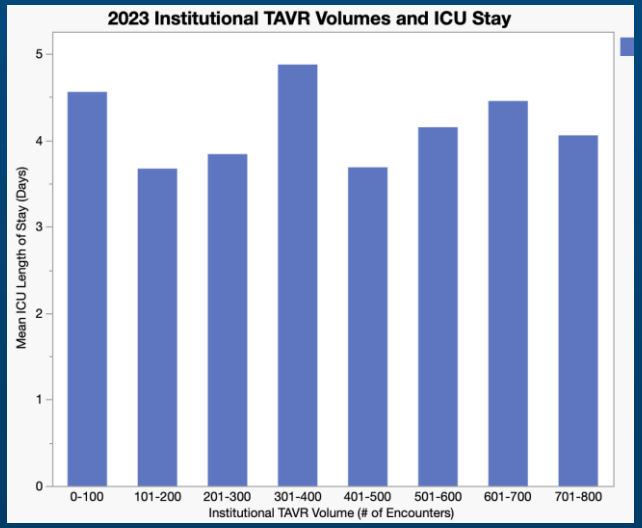


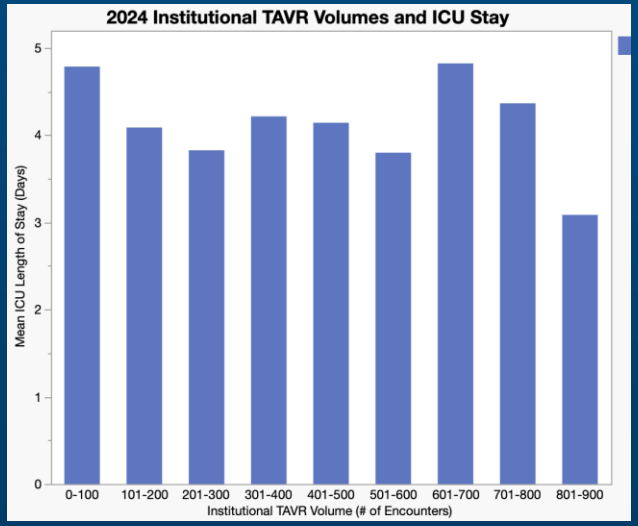


- Institutional volume had a significant effect on length of stay in all 3 years ($p<0.01$).

ICU Length of Stay

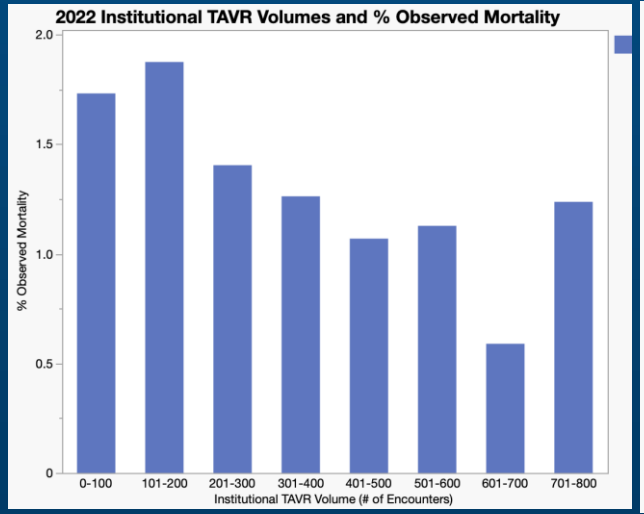


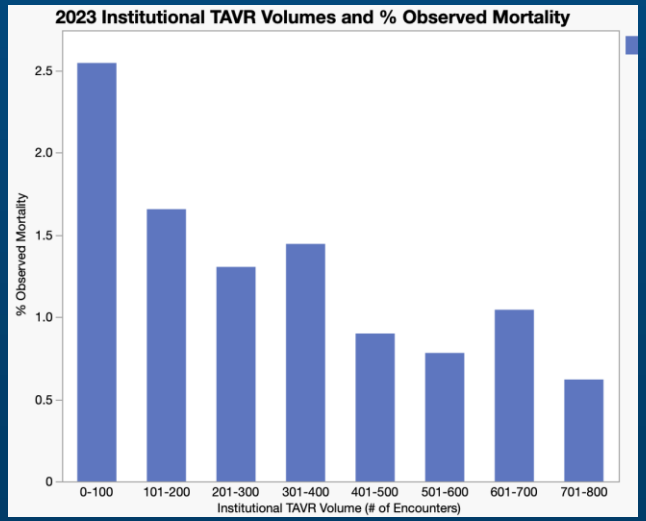


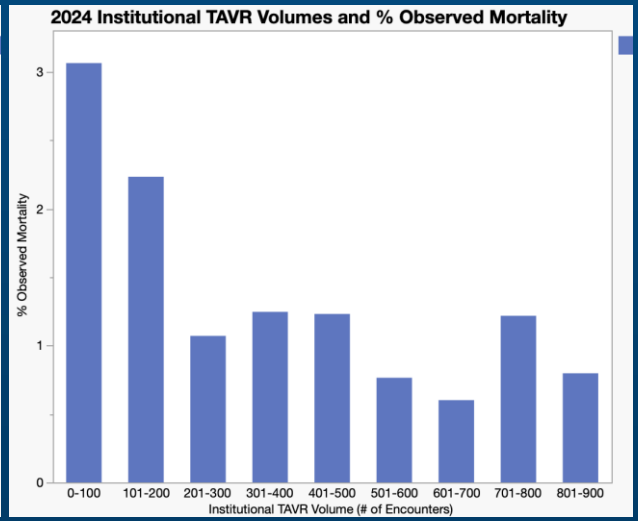


- No statistically significant differences were observed ($p>0.05$).

Observed Mortality







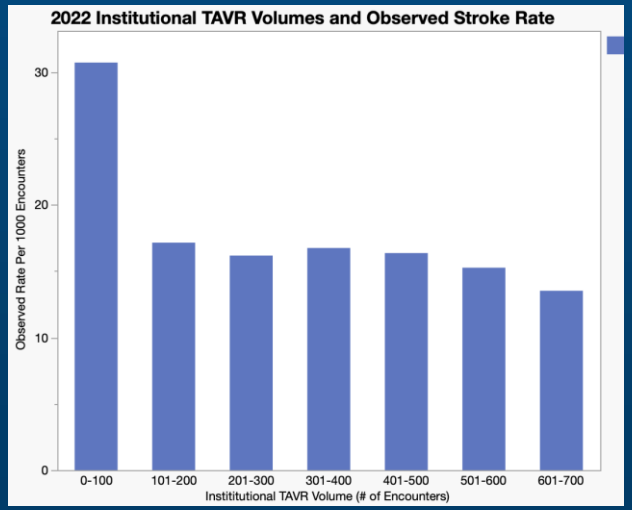
- Institutional volume only had a significant effect on observed mortality in 2024 (p=0.0004).

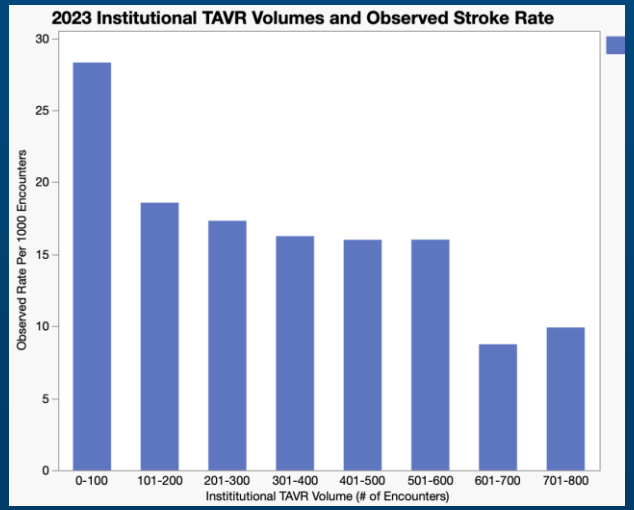
ANOVA and ANCOVA Analysis

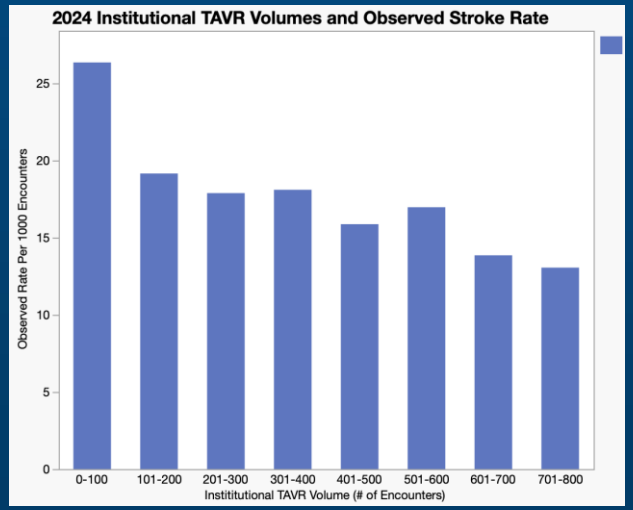
OUTCOME	2022 ANOVA *p*-Value	2022 ANCOVA *p*-Value	2023 ANOVA *p*-Value	2023 ANCOVA *p*-Value	2024 ANOVA *p*-Value	2024 ANCOVA *p*-Value
Length of Stay	0.0007	<0.0001	0.0016	0.0003	<0.0001	<0.0001
ICU Stay	0.3722	0.4808	0.5095	0.3730	0.3263	0.9005
% Observed Mortality	0.9639	0.0678	0.1811	0.0770	0.0004	<0.0001

- ANCOVA analysis was used to adjust for Case Mix Index (CMI).
- All significant relationships remained significant after adjusting for CMI.

In-Hospital Stroke Rates

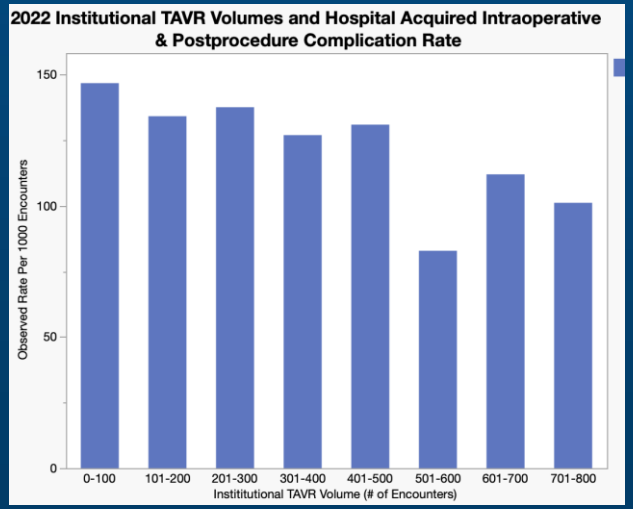


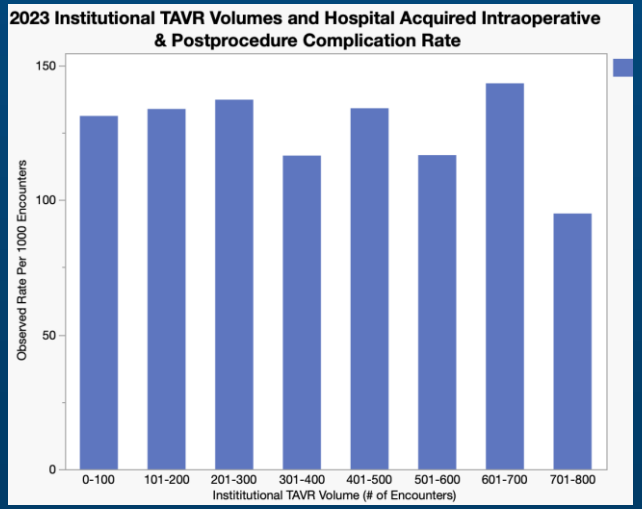


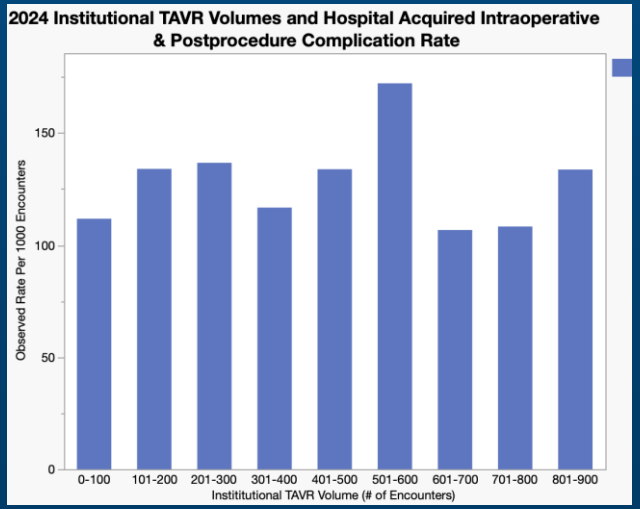


- No statistically significant differences were observed ($p>0.05$).

Intraoperative and Post-procedure Complications

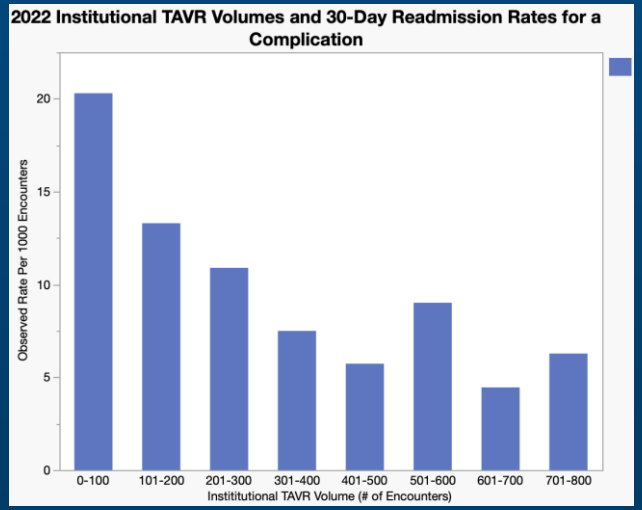


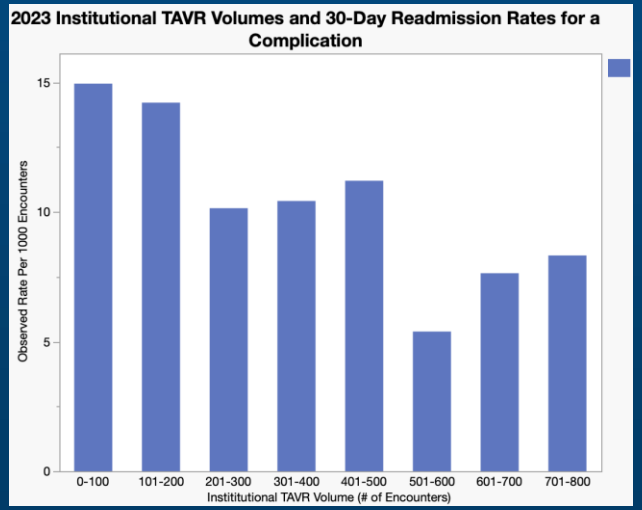


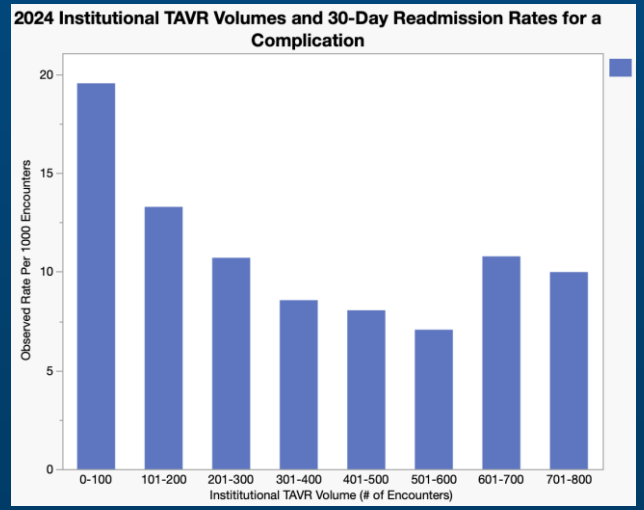


- No statistically significant differences were observed ($p>0.05$).

30-Day Readmission Rates for Complications

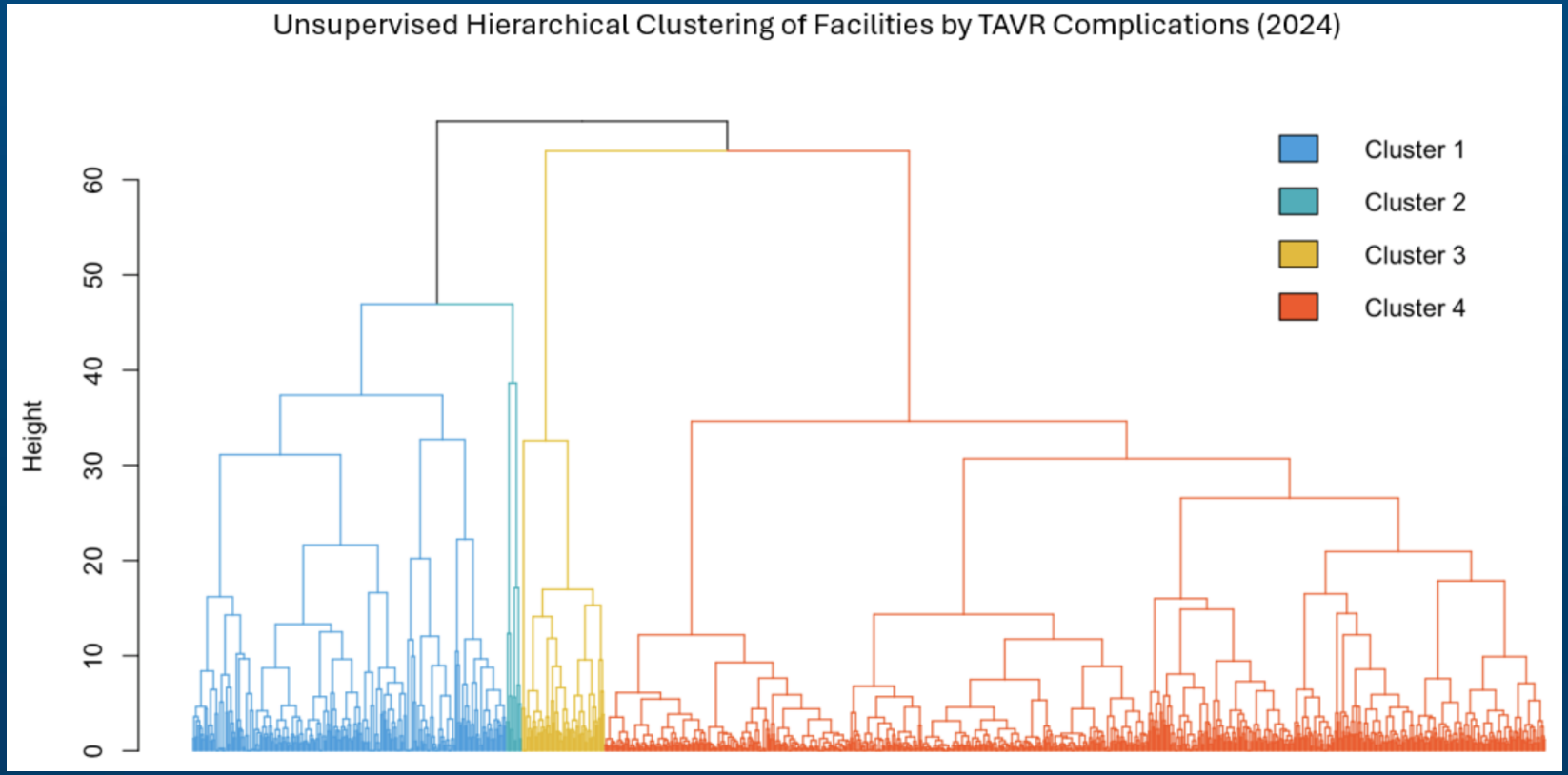






- Institutional volume only had a significant effect on readmission rates in 2022 (p=0.0478).

Clustering Analysis of TAVR Complications



Conclusion

- Higher institutional TAVR volume is independently associated with improved outcomes- reduced LOS and overall mortality.
- These associations persist after adjustment for CMI.
- No consistent significant differences in in-hospital stroke rates, intra-operative/post-operative complication rates, and 30-day readmission rates were observed across volume cohorts.