

Geographic Variation in Transcatheter Aortic Valve Replacement Versus Surgical Aortic Valve Replacement in Patients Under 65

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INTRODUCTION

Transcatheter aortic valve replacement (TAVR) has emerged as a rapidly expanding alternative to surgical aortic valve replacement (SAVR) over the past decade. American Heart Association and American College of Cardiology guidelines recommend SAVR for patients aged under 65.

Despite AHA/ACC recommendations, literature shows in 2021 half of all patients under 65 received a TAVR instead of SAVR¹. Current literature also reports worse 5-year survival outcomes when comparing TAVR and SAVR for patients under the age of 60.²

STUDY AIM

Analyze the proportion of TAVR procedures among aortic valve replacements (AVR) in patients under 65 and assess geographic differences (rural vs. urban) and hypothesize as to why we see deviations from guidelines.

METHODS

A patient cohort was built on the Truveta platform using the following inclusion criteria:

- Age at time of index procedure being <65
- CPT codes and associated modifiers for TAVR
- CPT codes and associated modifiers for SAVR

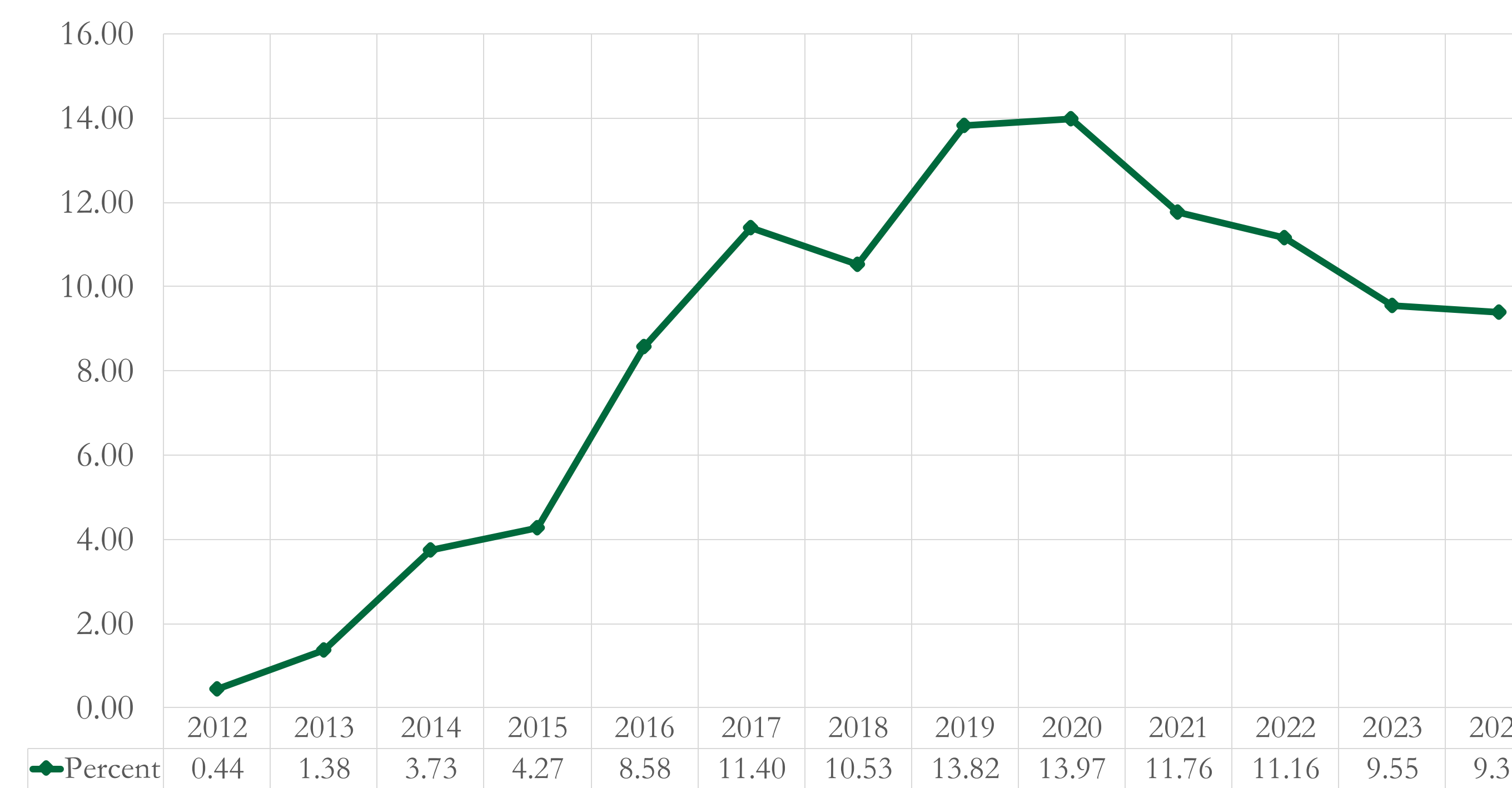
Patients with concomitant cardiac surgery procedures (another valvular replacement/repair, coronary bypass, etc.) during index SAVR were excluded.

Patients then were stratified based on geographic location using 3-digit zip codes.

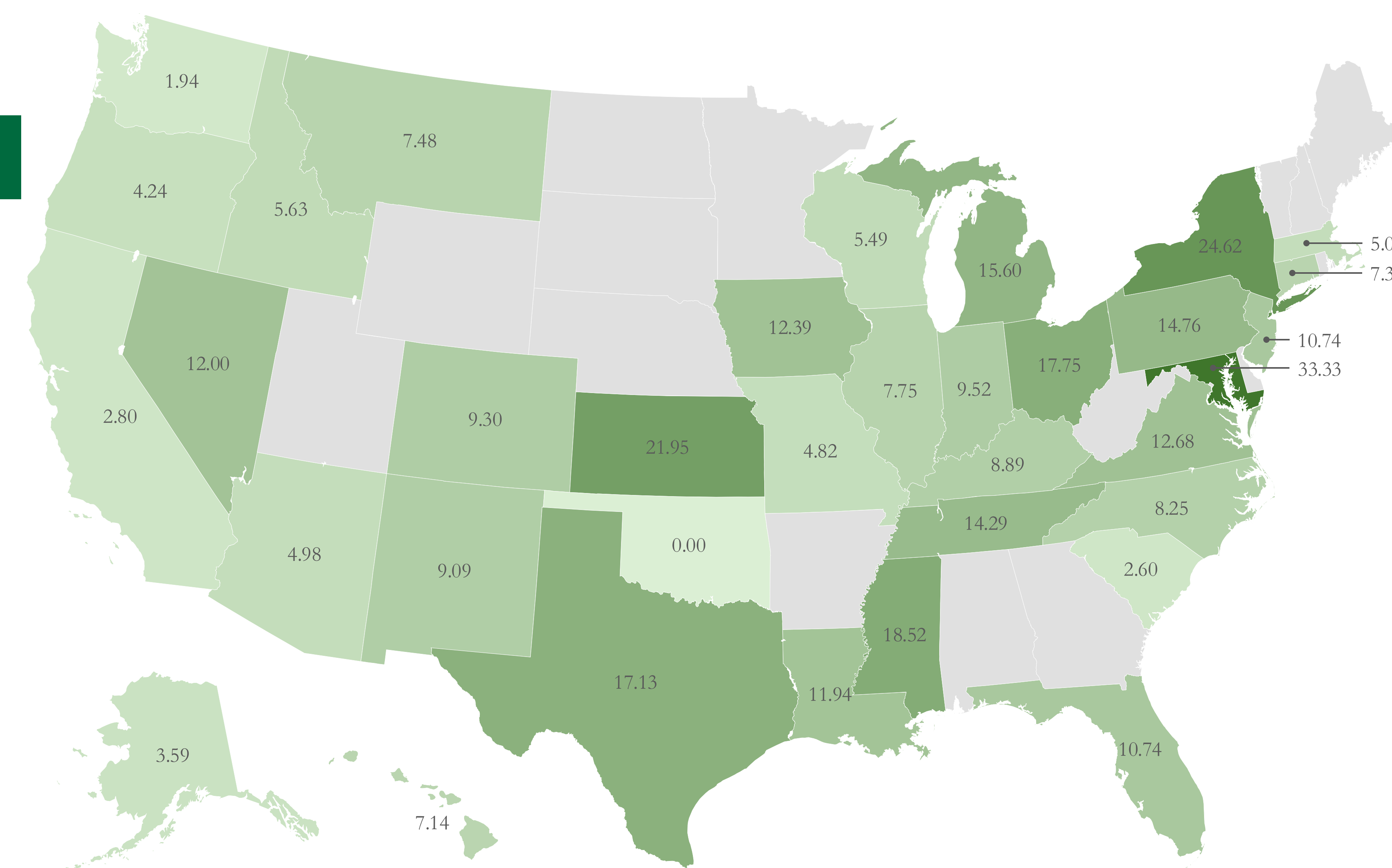
To define urban versus rural settings for the index procedure, Truveta uses a “Rurality Indicator” score number set at 0.3.

RESULTS

TREND IN TAVR AS A PROPORTION OF TOTAL VALVE REPLACEMENTS PER YEAR



PERCENT OF AORTIC INTERVENTIONS PERFORMED WITH TAVR (2012-2024)



DISCUSSION

Yearly trend did not match the trend reported in current literature. A lack of granularity with geographic information resulted in gaps within the data, making geographic variation indeterminate.

We were hypothesizing an increase in deviance from AHA/ACC guidelines in urban areas where patients have more options among cardiac surgeons. A factor in the decision to forego SAVR is avoiding open surgery which involves a longer hospital stay. TAVR lowers post-procedure downtime, though at the expense of increased short-term risk and worse outcomes in this patient population.

CONCLUSIONS

Current platform is not supportive for a geographic analysis of TAVR and SAVR trends in the United States.

Limitations

- Geographic data availability (30% of cohort blocked) and granularity (3- not 5-digit zip) from platform.
- Unclear definition of “rurality indicator” used by platform—limiting validation.
- Clinical detail allowing investigation into reasons for individual choice between SAVR and TAVR.

Future Direction

- Explore new platform for validation of research findings.
- Outcomes approach for our TAVR and SAVR cohort:
 - We are now using outcomes data for our cohort which is available on platform
 - Current work is stratifying patients by decade age (20-29, 30-39, etc.)
 - Will compare incidence of ischemic stroke and 1-year all-cause mortality amongst patients who received TAVR vs SAVR

References

1. Alabbadi, S., Bowdish, M. E., Sallam, A., Tam, D. Y., Hasan, I., Kumaresan, A., Alzahrani, A. H., Inbarne, A., Egorova, N., & Chikwe, J. (2025). Transcatheter versus surgical aortic valve replacement in patients younger than 65 years in the United States. *The Journal of thoracic and cardiovascular surgery*, 170(3), 698–706.e19. <https://doi.org/10.1016/j.jtcvs.2024.12.025>
2. Alabbadi, S., Malas, J., Chen, Q., Cheng, W., Tam, D. Y., Cohen, R. G., Bowdish, M. E., Egorova, N., & Chikwe, J. (2025). Guidelines vs Practice: Surgical Versus Transcatheter Aortic Valve Replacement in Adults ≤60 Years. *The Annals of thoracic surgery*, 119(4), 861–869. <https://doi.org/10.1016/j.athoracsur.2024.07.036>