

Healthcare Resource Utilization and Costs after Initiating Direct-acting Oral Anticoagulants or Low Molecular Weight Heparins in Patients with Venous Thromboembolism

#EE36

Godwin Okoye¹, Kenechukwu C. Ben-Umeh², Anton L.V. Avanceña^{1,3}, Eberechukwu Onukwugha⁴

¹Health Outcomes Division, College of Pharmacy, The University of Texas at Austin, TX, USA, ²Department of Pharmacotherapy, College of Pharmacy, University of Utah, Salt Lake City, UT, ³Department of Internal Medicine, Dell Medical School, The University of Texas at Austin, Austin, TX, ⁴Department of Practice, Sciences, and Health Outcomes Research, School of Pharmacy, University of Maryland, Baltimore, MD

 **TEXAS Pharmacy**
The University of Texas at Austin
College of Pharmacy

Background

- Venous thromboembolism (VTE)** is associated with significant clinical and economic burden. VTE is treated with anticoagulants **low molecular weight heparin (LMWH)** and, more recently, with **direct-acting oral anticoagulant (DOAC)**.
- While prior trials have shown that DOACs perform better than LMWH, it is unclear whether this translates to lower economic burden.
- This study aims to compare healthcare resource utilization and costs among patients with VTE who initiate DOAC or LMWH in the US.**

Methods

- Study design and data:** Retrospective cohort study using Merative MarketScan® Commercial Claims Data (1/1/2016-12/31/2021)
- Population:** Commercially insured adults (18-64 years)
- Exposure:** DOAC or LMWH initiated \leq 90 days after VTE diagnosis
- Covariates:** Baseline sociodemographic and clinical characteristics were assessed 12 months prior to index date of DOAC or LMWH initiation. We used inverse probability of treatment weighting (IPTW) to adjust for unbalanced covariates.
- Follow up:** intention-to-treat approach was adopted where first anticoagulant initiated were considered their index medication and patients were followed for 12 months following index date
- Outcomes:** inpatient visits, emergency room visits, outpatient visits, and total VTE-related healthcare cost (in 2022 US\$)
- Statistical analysis:** Logistic regression was used to model inpatient and emergency room visits, while negative binomial count model was used to model outpatient visits. To compare costs, we used a two-part model that accounts for zero values (logistic regression) and skewed non-zero values (generalized linear model with a gamma distribution and a log link)

Results

- We included 20,958 patients with VTE: 16,884 (80%) DOAC users and 4,074 (20%) were LMWH users (QR code, Table 1).
- Inpatient visits was the biggest driver of cost (54.22% vs 72.23%) for DOAC vs LMWH (Figure 1)
- Patients treated with DOAC had lower adjusted odds of emergency room visits (aOR 0.88, 95% CI 0.78, 0.99) and inpatient visits (aOR 0.54, 95% CI 0.49, 0.60) compared to LMWH users. (Figure 2)
- DOAC users also had a lower adjusted incidence rate of outpatient visits (IRR 0.53, 95% CI 0.51, 0.55). (Figure 2)
- DOAC was associated with cost reduction of \$9,182 (95% CI - \$10,415 to -\$7,950) in VTE-related costs. (Table 2, Figure 3)

Results

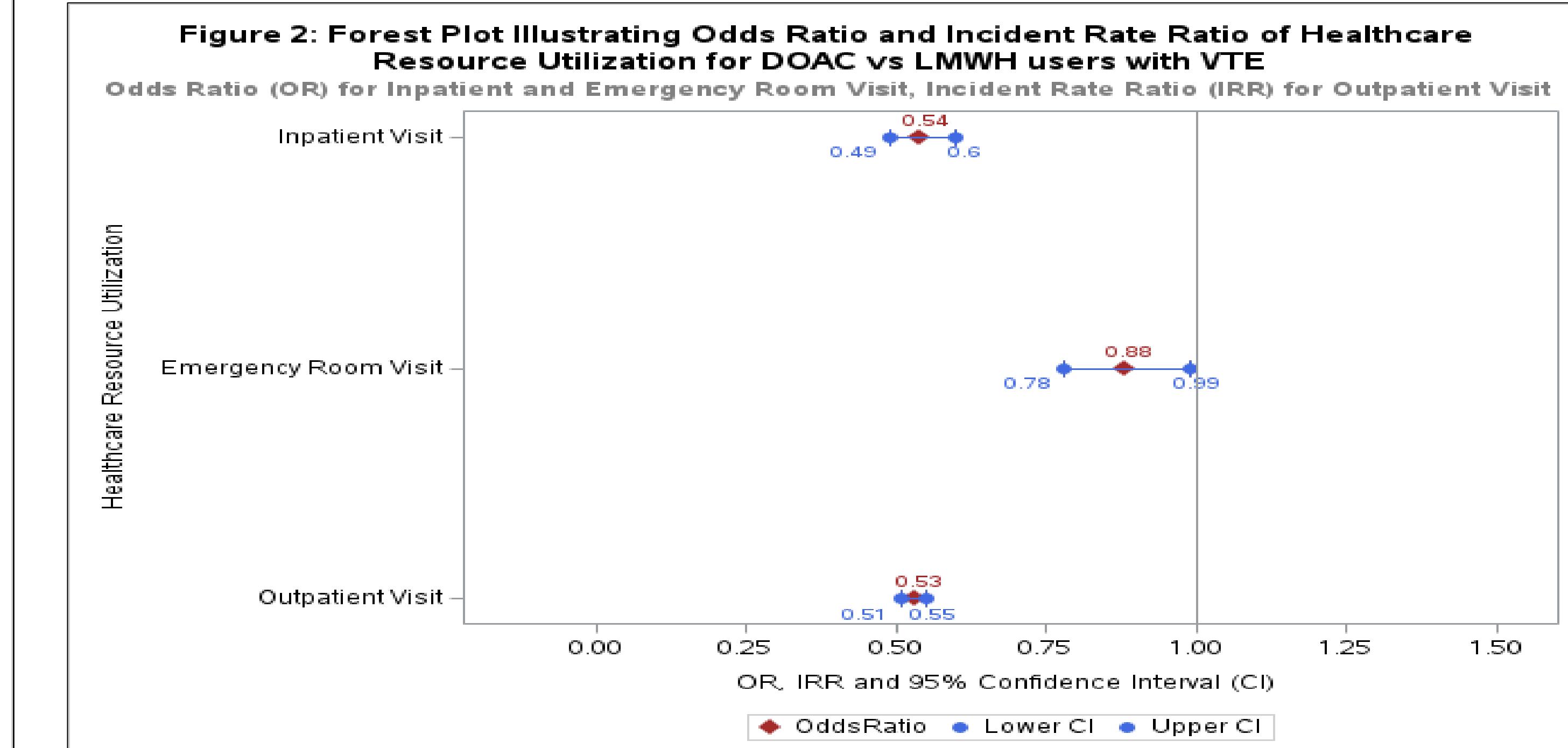
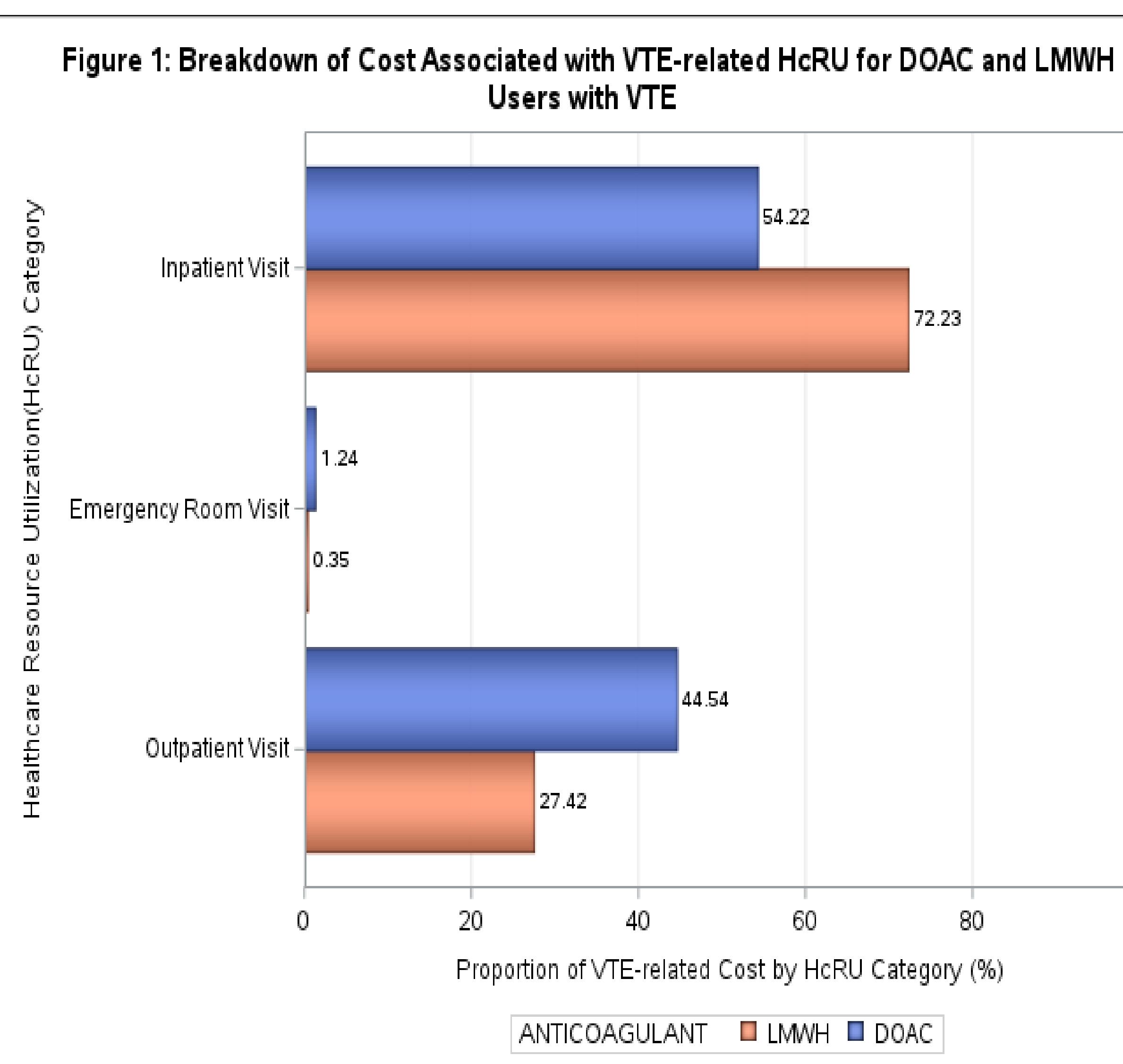
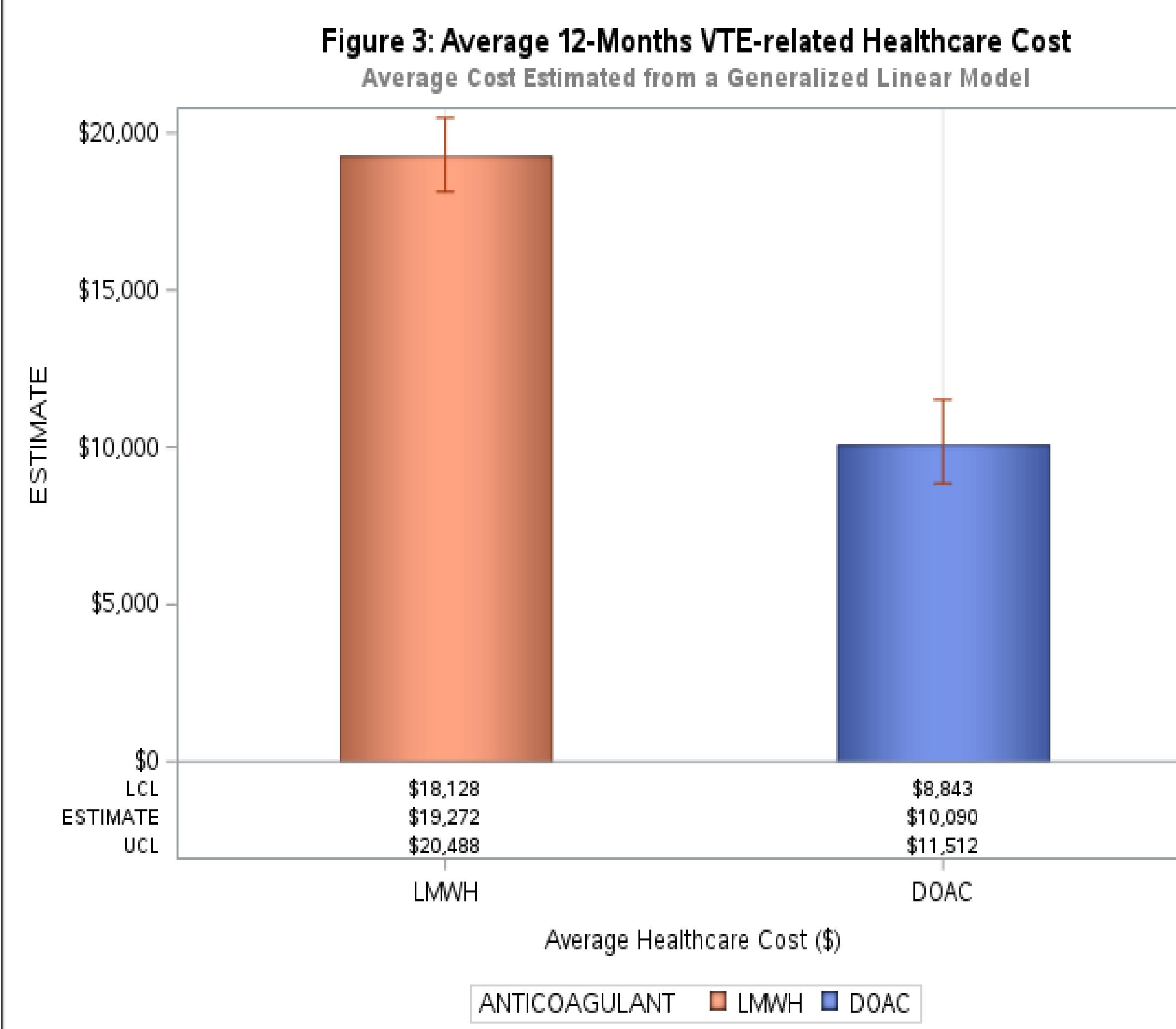


Table 1. Baseline characteristics

	Weighted		
	DOAC	LMWH	SMD N=4,051 *
Age, mean (SE)	50.12 (10.59)	50.03 (10.32)	0.00
Female sex, n (%)	10,992 (65.04)	2,627 (64.86)	0.01
CCI, n (%)	0 (62.35) 1 (18.08) 2 (10.59) ≥ 3 (8.99)	2,360 (58.26) 757 (18.69) 502 (12.39) 432 (10.66)	0.09

*We used <0.1 to establish covariate balance
CCI, Charlson Comorbidity Index; SE, standard error; SMD, standard mean difference.

Table 2: Two-part model				
Logit Model				
Label	Odds Ratio	95% CI	P value	
Non-zero cost	1.17	1.09 - 1.26	<0.001	
GLM (Total HcRU Cost)				
Average Marginal Effect				
DOAC vs LMWH	Estimate (\$)	95% CI (\$)	P value	
	-9,182	-10,415 to -7,950	<0.001	

The 95% confidence interval (CI) for the average marginal effect were calculated using the delta method.

Strengths and Limitations

- Strengths:** We used recent real-world data and included $>20,000$ patients with VTE (prior trials have ~ 300 participants). We controlled for measured confounding using IPTW.
- Limitations:** Choice of anticoagulant may vary based on underlying medical condition(s) of the patient, which we did not account for. Our use of claims data limits the generalizability of our findings and is subject to coding errors that may lead to misclassification.

Conclusions

DOAC use is associated with reduced inpatient, outpatient, and emergency room visits and lower healthcare costs compared to LMWH use in patient with VTE. These findings provide valuable insights for optimizing VTE therapy in clinical practice.



QR code contains more granular information on this study