

TOTAL COSTS OF TREATMENT OF PATIENTS SUFFERING FROM VENOUS THROMBOEMBOLISM

– implications of different cost perspectives

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Introduction

Non-vitamin K oral anticoagulants (NOACs, i.e. apixaban, dabigatran etexilate, edoxaban and rivaroxaban) have shown to be effective compared to standard of care in the treatment of venous thromboembolism (VTE) - a common cardiovascular disorder that includes deep vein thrombosis and pulmonary embolism. Standard of care has consisted of at least 5 days of low molecular weight heparin (LMWH) followed by a Vitamin K Antagonist (VKA) treatment for at least 3 months.

Cost-effectiveness of NOACs depend on the cost perspective applied. Costs and cost-effectiveness analyses can apply different cost perspectives from the “drug costs only” to the widest societal perspective, including production loss. The broadest possible perspective is recommended to avoid suboptimal decisions. Healthcare decision-makers responsible for specific budgets, e.g. at regional and hospital levels, tend to require more narrow cost perspectives focusing on consequences for one budget (e.g. drug budget). This is referred to as a drug silo mentality.^{1,2}

Objective

The first objective of the study was to compare the total costs of different drug strategies in the treatment of VTE in Denmark. Secondly, the implications of different cost perspectives from the narrow drug budget perspective to the widest societal perspective are illustrated and discussed.

Methods

In a modelled costs analysis, treatment of VTE patients with NOACs (apixaban, dabigatran etexilate, edoxaban or rivaroxaban) was pairwise compared with the LMWH/VKA alternative. The relative risk of recurrent VTE events and major bleedings was based on significant clinical outcomes from phase 3 trials.³⁻⁶

The analysis of six months costs of treatment was made for five cost perspectives as presented in Figure 1, i.e. Drug only; drug and visits; healthcare sector; public sector; and societal perspective. The costs included are: Drugs, GP/specialist visits for INR-monitoring and control, 3-year present value of VTE events and major bleedings, and production loss due to disease and premature death (Table 1).

Results

Figure 1: Flow chart of study populations

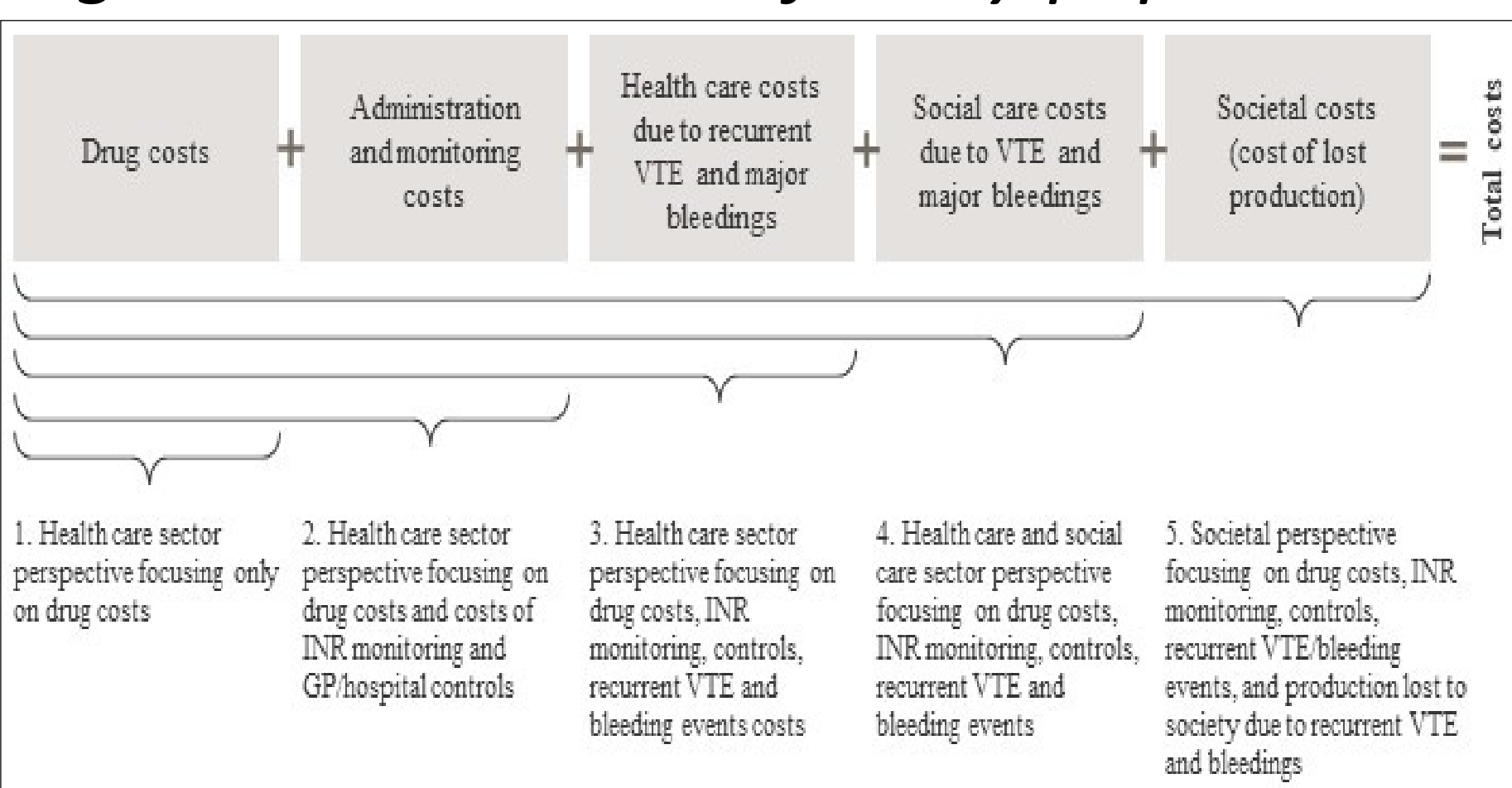


Table 1: Applied cost estimates (€)

	LMWH/VKA	NOACs			
		Apixaban	Rivaroxaban	Dabigatran etexilate	Edoxaban
6 months costs					
Drug costs, 6 months treatment	229	583	602	671	653
Costs of administration and monitoring per patient within 6 months*	520	218	218	218	218
Event costs with different perspectives		Health care costs	Social care costs	Production loss	Societal (total cost)
Cost per event, recurrent VTE**		11,781	809	24,875	37,465
Cost per event, major bleeding**		13,451	1,490	35,594	50,534

Table notes: * Model calculations.

** Present value of the 3-years average extra cost of first VTE or major bleeding event.⁷

Figure 2: Six months costs per VTE patient receiving LMWH/VKA versus apixaban (€)

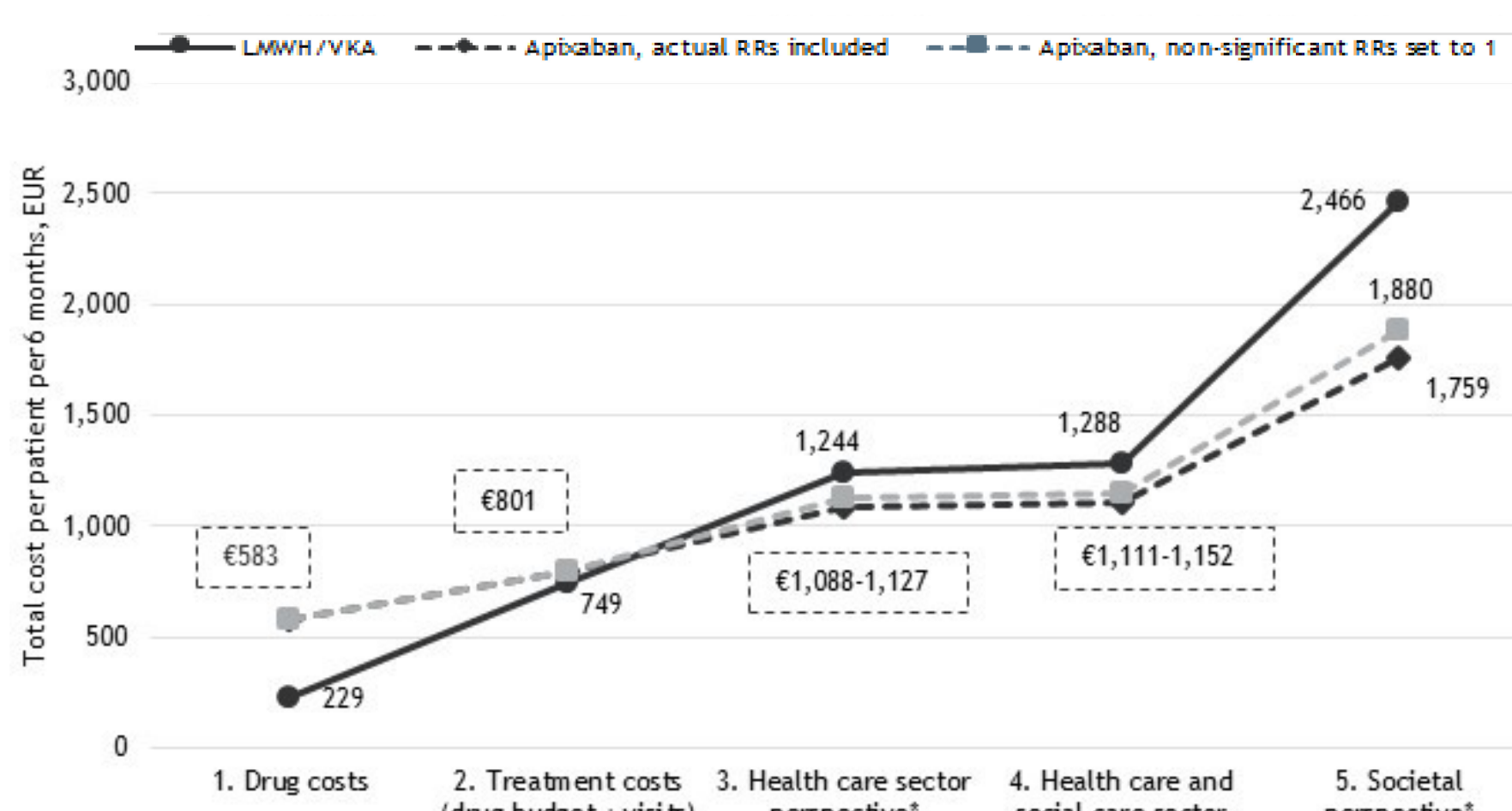


Figure 3: Six months costs per VTE patient receiving LMWH/VKA versus dabigatran etexilate (€)

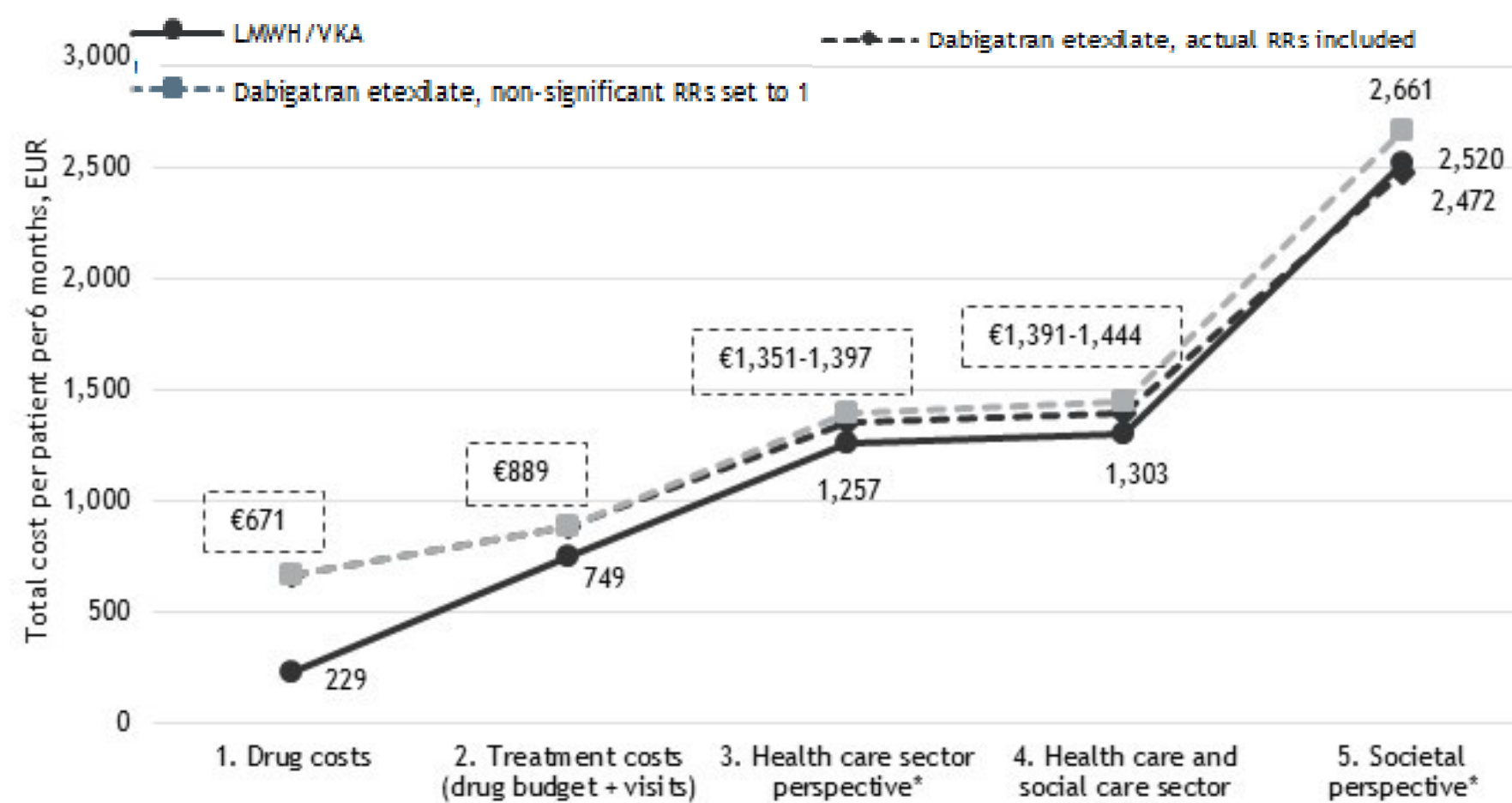


Figure 4: Six months costs per VTE patient receiving LMWH/VKA versus edoxaban (€)

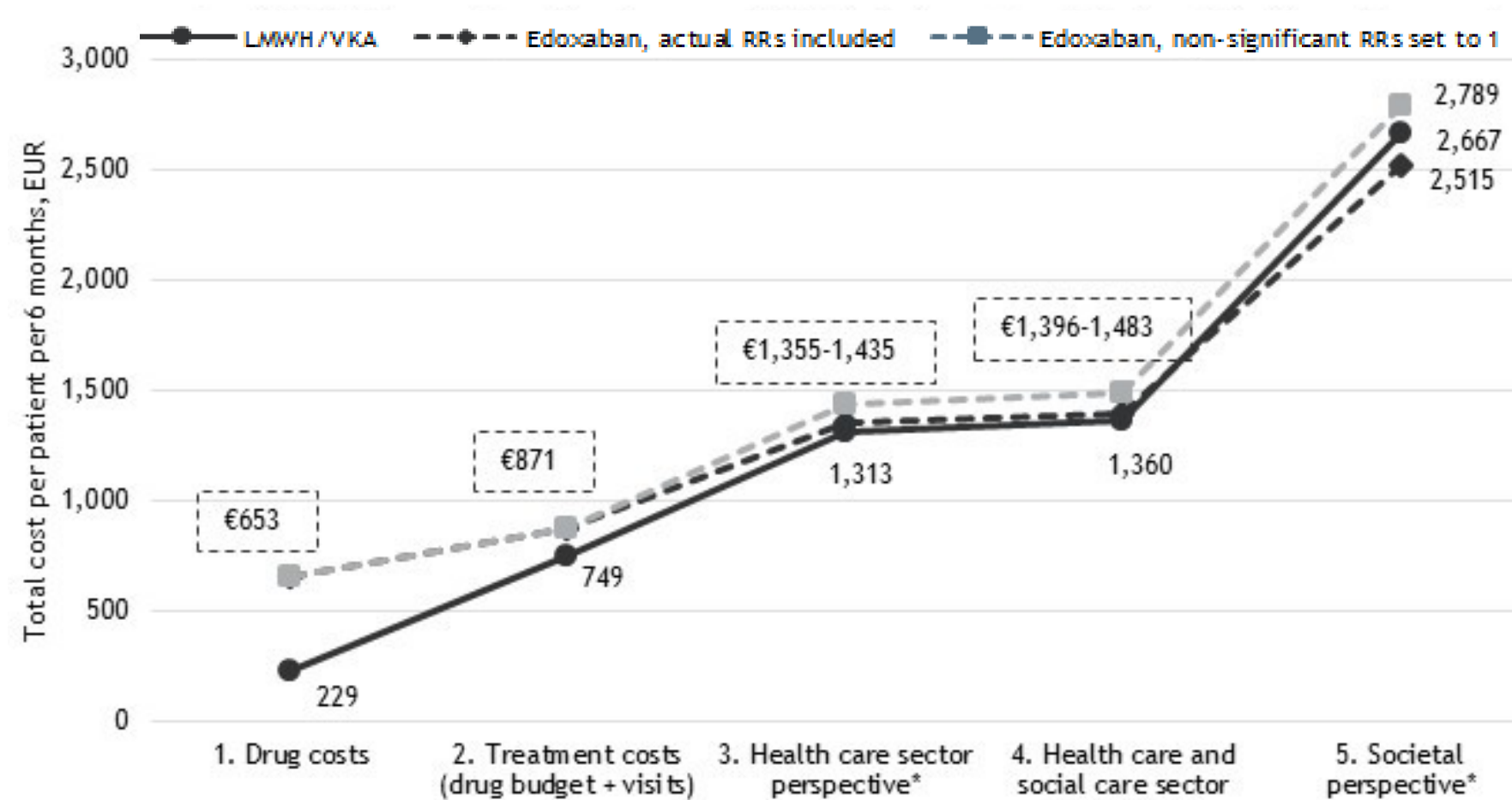
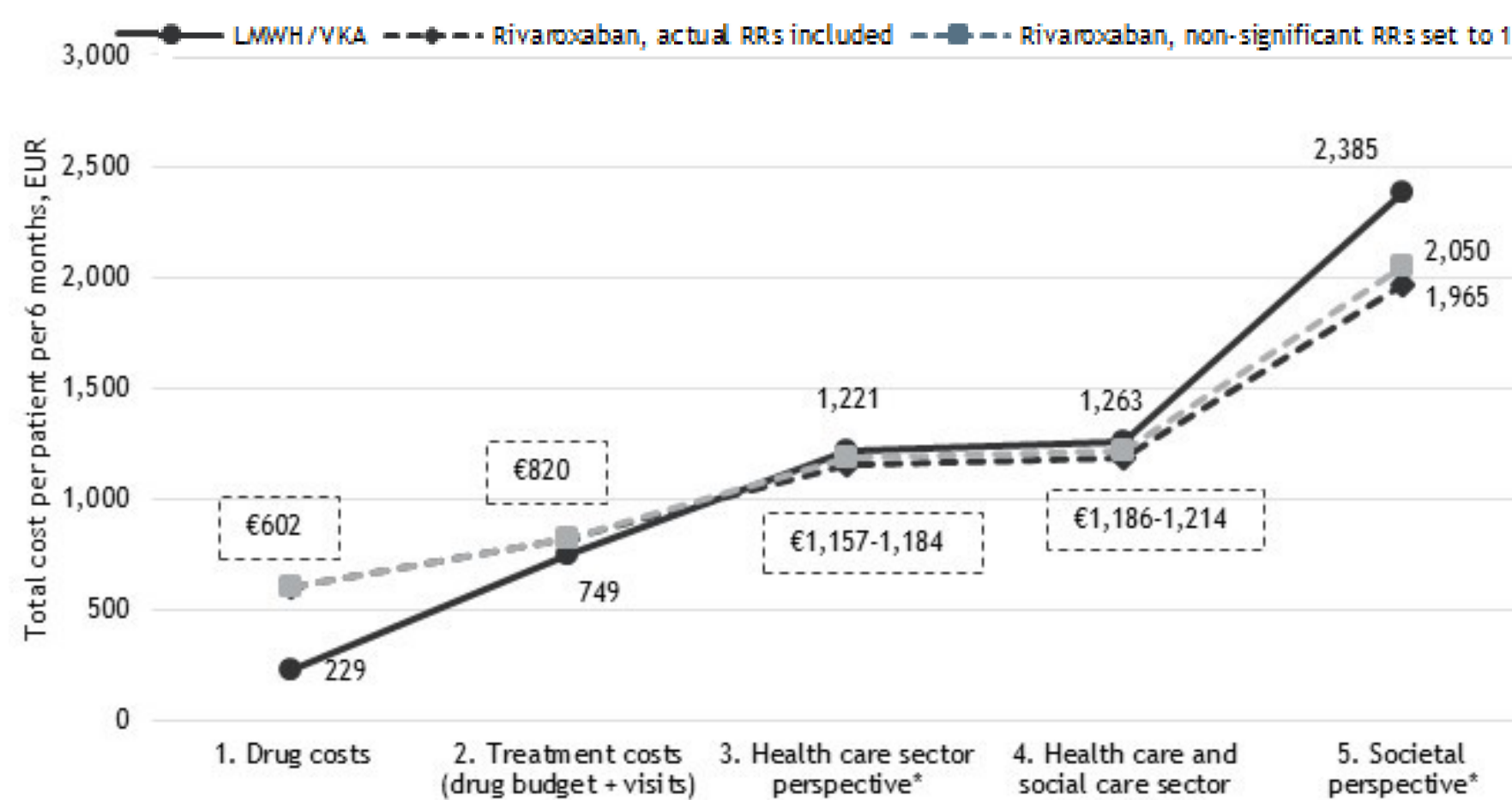


Figure 5: Six months costs per VTE patient receiving LMWH/VKA versus rivaroxaban (€)



Figures 2-5 show the six months costs per VTE-patient treated with each of the four NOACs compared to LMWH+VKA in the five different cost perspectives.

In the Drug only perspective LMWH+VKA is the least costly option compared to all NOACs. When adding GP/specialist visits the costs of LMWH+VKA is almost equal to the costs of NOAC alternatives (visit perspective).

When costs of recurrent VTE episodes and major bleedings are added (health care perspective) apixaban (€868) and rivaroxaban (€922) becomes the least costly option for 6 months of treatment.

Finally, when costs of social care and production loss are added in the public sector and/or societal perspectives, all NOACs becomes less costly options compared to LMWH/VKA. Apixaban is associated with lowest societal costs (€1,759) followed by rivaroxaban (€1,965), dabigatran etexilate (€2,472) and edoxaban (€2,515).

Conclusions

LMWH+VKA is associated with the lowest costs, if only drug costs are considered. However, broader cost perspectives show that apixaban and rivaroxaban have lower six months costs than LMWH+VKA (healthcare sector perspective).

Consequently, in countries where decisions regarding use of drugs are based on drug costs only, the estimate of treatment costs is misleading. The present study shows that decisions on VTE-treatment should be based on as broad a cost perspective as possible to avoid the risk of suboptimal decision making. Similar findings have been published in the case of atrial fibrillation.⁸

The present analysis in VTE was recently published in *Journal of Medical Economics*.⁹

References

1. Drummond et al. Oxford University Press; 2005.
2. Garrison et al. Value Health 2003;6(s1):S1.
3. Agnelli et al. N Engl J Med. 2013;369(9):799-808.
4. Prins et al. Thromb J. 2013;11(1):21.
5. Schulman et al. Circulation. 2014;129(7):764-772.
6. Hokusai-VTE et al. N Engl J Med. 2013;369(15):1406-1415.
7. Gustafsson et al. ClinicoEco Outcomes Res 2018;10:563-572.
8. Poulsen et al. ClinicoEco Outcomes Res 2017;9:617-627.
9. Nielsen et al. J Med Economics 2019;Sep 27:1-7.

Disclosures

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