

PCV40 BUDGET IMPACT ANALYSIS OF THE USE OF RIVAROXABAN IN THE TREATMENT OF VENOUS THROMBOEMBOLISM IN SPAIN



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BACKGROUND AND AIM

- Venous thromboembolism (VTE) encompasses pulmonary embolism (PE) and deep vein thrombosis (DVT). VTE incidence is 154 cases per 100,000 inhabitants and grows exponentially with age.¹ 47% of VTE cases are diagnosed as DVT, whereas PE corresponds to 53% in Spain. Mortality varies greatly according to the type of VTE ranging from 2.3% in DVT to 11.6% in the case of PE.² Its morbidity is also important.³
- VTE standard treatment consists in the administration of low molecular weight heparins (LMWH) plus vitamin K antagonists (VKA), which are added a few days after starting the treatment, until the international normalized ratio (INR) reaches values between 2 and 3 for 24 hours, to continue the treatment with VKA for at least 3 months.⁴
- VKA treatment presents limitations like interactions with other drugs and food, and the need of periodic monitoring of INR among others. Such potential problems can lead to higher risks of bleeding and thrombosis.⁵
- The updated clinical guidelines from ACCP recommend the use of direct oral anticoagulants (DOAC) for patients with VTE and no cancer as long-term anticoagulant therapy over VKA.⁶ Among DOACs, rivaroxaban has proven to have a similar efficacy to the combined treatment (LMWH and VKA) and superior safety in randomized clinical trials (EINSTEIN program)⁷, as well as, in the international observational XALIA study⁸ in the clinical routine practice.
- The retrospective EDITH Study⁹ in the Spanish clinical routine practice of patients diagnosed with VTE shows that in the outpatient management the introduction of oral anticoagulants was less than would be expected according to the guidelines of recommendation and a more prolonged duration of LMWH treatment it was observed.¹⁰
- The aim of this study was to estimate the potential cost-savings associated to the rivaroxaban use in VTE treatment and recurrence prevention from the Spanish National Health System (NHS) perspective for the first three years from its reimbursement.

METHODS

- A budget impact model (BIM) was developed from the NHS perspective using real life evidence from an observational retrospective study conducted in Spain (EDITH study).⁹
- The BIM estimates the difference in the annual cost treatment between 3 scenarios:
 - Current scenario: current clinical patterns (rivaroxaban not reimbursed).
 - Alternative scenario 1: hypothesizes the progressive introduction of rivaroxaban replacing LMWH monotherapy by 10%, 15% and 20% in the first, second and third year from its reimbursement (2017-2019), respectively.
 - Alternative scenario 2: hypothesizes that rivaroxaban totally replaces LMWH monotherapy over the next three years (2017-2019).
- The Spanish adult population¹¹ was included in the BIM considering data from annual incidence of VTE in Spain.² Neither oncologic patients (14% of the Spanish patients according to the RIETE study¹²), nor patients with high risk PE (5%)¹³ were included, since these patients require thrombolytic treatment.
- Considering the mean treatment duration from discharge to the end of the follow-up period, the EDITH study⁹ determined the VTE treatment in the clinical practice approach as in Table 1.

Table 1. Treatment patterns in the Spanish clinical practice⁹

Treatment	%	DVT		%	PE	
		Mean treatment days LMWH	VKA		Mean treatment days LMWH	VKA
LMWH monotherapy	41.90%	133	-	28.43%	141.7	-
VKA monotherapy	10.06%	-	174	45.23%	-	168.8
Combined therapy	48.04%	19.7	151.2	26.34%	19.9	155.3

- Only pharmacologic costs were included in the analysis and unit costs were extracted from Spanish official sources.¹⁴ Moreover, the 8/2010 Royal Decree¹⁵ discount was considered as well as co-payment (NHS assuming the 90% of the treatment cost) (Table 2).

Table 2. Daily treatment cost

Treatment	Cost (included VAT) ¹⁴	Mean doses per day	Cost per day	RD 8/2010 discount ¹⁵	Co-payment	NHS cost per day
Rivaroxaban 15/20 mg, 28 pills	€84.80	15 mg/bid 21 days start treatment + 20 mg od	€3.03	7.50%	90%	€2.52
Acenocoumarol 4 mg, 20 pills (VKA)	€2.67	4 mg/day according to experts	€0.13	15%	90%	€0.10
Enoxaparin 80 mg, 30 syringe (LMWH)	€217.47	Mean dose has been estimated as the average between 80mg BID and 120mg OD dose	€12.07	15%	90%	€9.23
Enoxaparin 120 mg, 30 syringe (LMWH)	€289.13					

- Rivaroxaban cost was estimated assuming the same treatment duration as in the case of a patient in monotherapy LMWH treatment (Table 3).
- Table 3 represents the calculation of the mean treatment cost with the 4 therapeutic options, multiplying the daily cost by the mean number of treatment days in DVT and PE patients.

Table 3. Mean pharmacologic costs

Treatment	Cost per day	DVT		Cost per day	PE	
		Mean treatment days	Mean cost by treatment		Mean treatment days	Mean cost by treatment
LMWH monotherapy	€9.23	133	€1,227.84	€9.23	141.7	€1,308.16
VKA therapy	€0.10	174	€17.77	€0.10	168.8	€17.24
Combined therapy	LMWH	19.7	€197.31	€9.23	19.9	€199.58
	VKA	151.2		€0.10	155.3	
Rivaroxaban	€2.52	133	€388.28	€2.52	141.7	€410.21

RESULTS

- The target population for rivaroxaban VTE treatment and recurrence prevention was estimated in 49,214-to-49,252 in the three years from its reimbursement (Table 4).

Table 4. Target population to receive rivaroxaban

	2017	2018	2019			
Spanish population > 18 years old	38,053,404	38,057,807	38,083,039			
VTE annual incidence	0.15%	58,602	0.15%	58,609	0.15%	58,648
Oncologic patients	14.00%	8,204	14.00%	8,205	14.00%	8,211
High risk PE patients	5.00%	1,184	5.00%	1,184	5.00%	1,185
DVT patients		26,711		26,714		26,732
PE patients		22,503		22,505		22,520
Target population to receive rivaroxaban	49,214	49,219	49,252			

- In a scenario where rivaroxaban reimbursed would replace LMWH monotherapy use by 10%, 15% and 20% for the treatment and recurrence prevention of VTE in the next three years, this would result in a mean annual savings for the NHS of €4,263,169, €6,395,493 and €8,532,978 (cumulative savings of €19,191,641) (Figure 1).
- In an other scenario, considering that rivaroxaban would replace all LMWH monotherapy over the next three years in VTE treatment and recurrence prevention, this would result in a potential cost-savings for the NHS of €15,141,750, €15,143,503, and €15,153,543, in 2017, 2018, and 2019, respectively (cumulative savings of €45,438,796) (Figure 2).

Figure 1. Impact of introducing the use of rivaroxaban by 10%, 15% and 20% (scenario 1) for VTE treatment and recurrence prevention for the first three years from its funding (2017-2019)

	2017	2018	2019	Accumulated cost
Total cost (current scenario) (w/o rivaroxaban)	€26,050,072	€26,053,086	€26,070,359	€78,173,517
Total cost (alternative scenario 1) (with rivaroxaban)	€21,786,903	€19,657,593	€17,537,381	€58,981,877

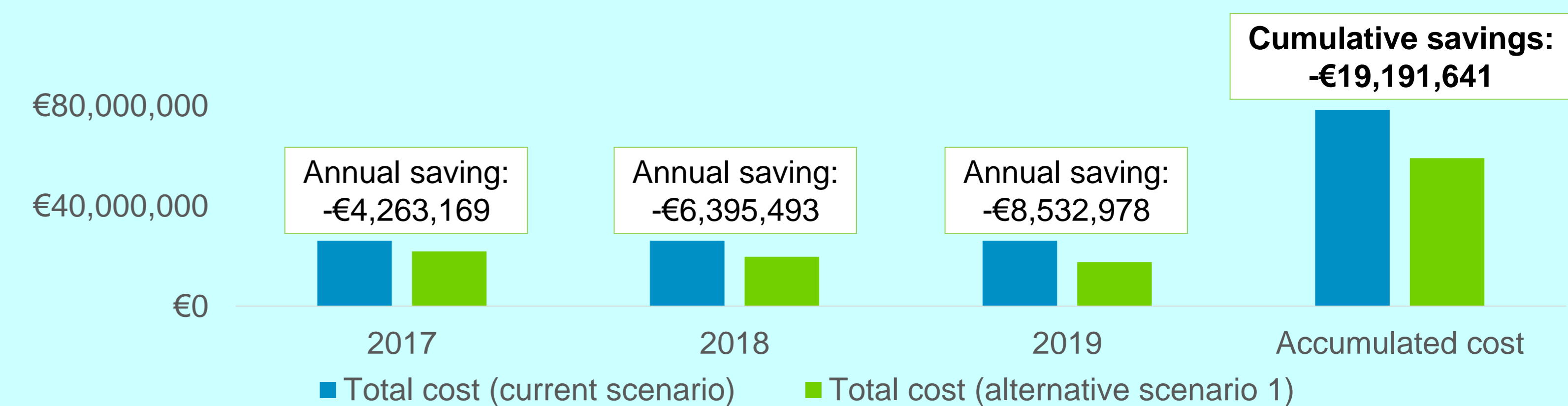
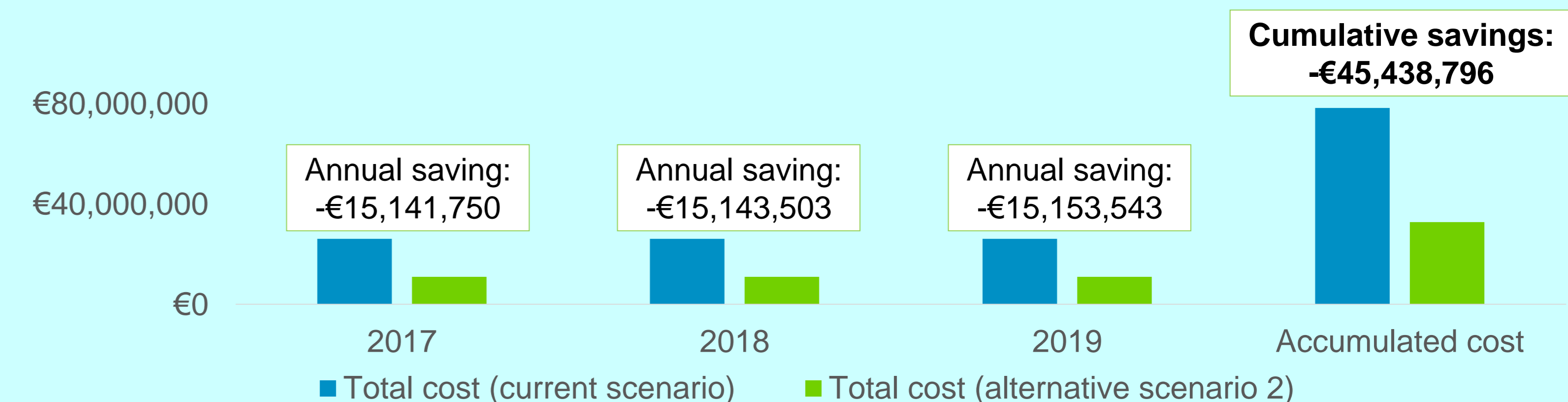


Figure 2. Impact of totally replacing LMWH monotherapy by rivaroxaban (scenario 2) for VTE treatment and recurrence prevention for the first three years from its funding (2017-2019)

	2017	2018	2019	Accumulated cost
Total cost (current scenario) (w/o rivaroxaban)	€26,050,072	€26,053,086	€26,070,359	€78,173,517
Total cost (alternative scenario 2) (with rivaroxaban)	€10,908,321	€10,909,584	€10,916,817	€32,734,722



CONCLUSIONS

- There is a prolonged use of LMWH according to the current clinical routine in Spain, resulting in an incremental cost for the Spanish NHS.
- Rivaroxaban reimbursement could provide elevated cost-savings in the treatment and prevention of DVT and PE for the Spanish NHS.

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