

SUPPLEMENTAL MATERIALS

## 1.0 Supplemental Tables

**Supplemental Table I. Sources used to obtain costs for analyses**

Study/ Source	Country	Currency	Components included in costs	Cost (reported year currency)	Cost (2020 currency)
LOS cost per day					
Gershengorn (2015)[1]	US	2013 USD	Daily costs for quaternary surgical ICU	\$1766.67	\$2,138.79
Chen (2019)[2]		2018 USD	Average cost for ward cost per day across bariatric, colectomy, hepatic resection, lobectomy, and hysterectomy procedures in Americas	\$966.22	\$1,025.97
ENC MCO (2016)	France	2016 Euros	Medical professionals, pharmacy, and overhead (e.g. cleaning, laundry)	€226.28	€226.39
Dodel (2004)[3]	Germany	2002 Euros	Diagnostic procedures, medical treatment, drugs, physiotherapy, speech therapy, nursing, and nonmedical supplies	€360.00	€507.48
Fattore (2012)[4]	Italy	2007 Euros	Resources used during the index hospitalization (e.g. drugs, imaging and laboratory exams, consumables, medical procedures, consultation visits, inpatient rehabilitation)	€412.81	€512.07
Vega-Valdes (2018)[5]	Spain	2016 Euros	Diagnostic procedures and medical treatment	€1,051.54	€1,072.48
Carlsson (2017)[6]	Sweden	2015 Swedish Krona	Resources used in a neurological ICU and the neurological department	ICU: SEK 16,223.42 SBD: SEK 4,836.08	ICU: SEK 16,929.79 SBD: SEK 5,046.64
Ming Xu (2018)[7]	UK	2015 Pounds	Resources used in an acute stroke unit and a general medical ward	ICU: £649.00 SBD: £210.00	ICU: £728.18 SBD: £235.62
Device cost					
Internal market research for	US	-	Stent retrievers and aspiration devices	-	Stent retriever: \$7,852 Aspiration device: \$5,415

Study/Source	Country	Currency	Components included in costs	Cost (reported year currency)	Cost (2020 currency)
stent retrievers and Vidal (2016)[8] for aspiration devices					
Internal market report[9]	France	-		-	Stent retriever: €2,300.00 Aspiration device: €932.00
	Germany	-		-	Stent retriever: €1,400.00 Aspiration device: €673.00
	Italy	-		-	Stent retriever: €3,420.00 Aspiration device: €946.00
	Spain	-		-	Stent retriever: €2,680.00 Aspiration device: €963.00
	Sweden	-		-	Stent retriever: SEK 26,136.04 Aspiration device: SEK 10,685.30
	UK	-		-	Stent retriever: £2,390.00 Aspiration device: £517.00
Cost per mRS score(s)					
Shireman (2017)[10]	US	2015 USD	Inpatient and outpatient costs including nursing home costs using data from the National Death Index and Centers for Medicare and Medicaid Services (CMS)	mRS 0: \$10,569.00 mRS 1: \$10,883.00 mRS 2: \$12,590.00 mRS 3: \$21,618.00 mRS 4: \$43,755.00 mRS 5: \$64,327.00	mRS 0: \$12,176.06 mRS 1: \$12,537.81 mRS 2: \$14,504.36 mRS 3: \$24,905.11 mRS 4: \$50,408.13 mRS 5: \$74,108.19
Spieler (2004)[11]	France	1997 Euros	Ambulatory care, orthosis, drugs, convalescent home, rehabilitation, new acute hospitalization, nursing home, and long-term chronic hospitalization	mRS 0-2: €10,000.00 mRS 3: €17,355.37 mRS 4-5: €31,322.31	mRS 0-2: €12,816.51 mRS 3: €22,243.53 mRS 4-5: €40,144.27
Fattore (2012)[4]	Italy	2007 Euros	Resources used from discharge to 12 months (e.g. hospital admissions, clinical consultations, diagnostic procedures, domiciliary care,	mRS 0-2: €1,964.80* mRS 3: €5,239.10* mRS 4-5: €13,381.50*	mRS 0: €2,071.65 mRS 1: €2,437.23 mRS 2: €2,802.82 mRS 3: €5,524.01

Study/ Source	Country	Currency	Components included in costs	Cost (reported year currency)	Cost (2020 currency)
			medical therapies, rehabilitation services, number of general practitioner visits, days of work lost, number of hours of informal care)		mRS 4: €7,473.66 mRS 5: €16,599.06
Dental and Pharmaceutical Benefits Agency (TLV)[12]	Sweden		Resources used for annual post acute care (healthcare professional time, emergency care, outpatient visits, day cases and hospitalisations)	mRS 0: SEK 71,600.00 mRS 1: SEK 94,000.00 mRS 2: SEK 147,200.00 mRS 3: SEK 178,700.00 mRS 4: SEK 233,900.00 mRS 5: SEK 284,700.00	mRS 0: SEK 74,717.49 mRS 1: SEK 98,092.80 mRS 2: SEK 153,609.15 mRS 3: SEK 186,480.67 mRS 4: SEK 244,084.10 mRS 5: SEK 297,095.95
Lobotesis (2016)[13]	UK	2014 Pounds	Long-term accommodation in warden housing and nursing or residential care	mRS 0: £2,846.00 mRS 1: £3,348.00 mRS 2: £3,850.00 mRS 3: £13,697.00 mRS 4: £18,532.00 mRS 5: £30,093.00	mRS 0: £3,255.06 mRS 1: £3,829.21 mRS 2: £4,403.36 mRS 3: £15,665.68 mRS 4: £21,195.62 mRS 5: £34,418.29

\* Although Fattore (2012) reported costs for aggregate mRS scores (i.e. mRS 0-2, mRS 3, mRS 4-5), they were converted to costs per individual mRS score (i.e. mRS 0 to 6) based on an Italian cost-effectiveness analysis.<sup>14</sup>

Abbreviations: ENC = L'Etude nationale des coûts; ICU = intensive care unit; LOS = length of stay; MCO = médecine, chirurgie, obstétrique et odontologie; mRS = modified Rankin Scale; NR = not reported; SBD = standard bed day; SEK = Swedish Krona; UK = United Kingdom; US = United States; USD = United States Dollars.

**Supplemental Table II. Clinical and healthcare resource use outcomes for the FPE (mTICI 3) and non-FPE (mTICI 3) groups**

Outcome	FPE (mTICI 3) (n=67)	Non-FPE (mTICI 3) (n=51)	P-Value*
<b>Clinical outcomes</b>			
90-day mRS (categorized into good and excellent functional outcomes) <sup>†</sup>			
90-day mRS, good outcomes (mRS 0-2), n (%)	50 (78.13%)	30 (62.50%)	0.07
90-day mRS, excellent outcomes (mRS 0-1), n (%)	40 (62.50%)	26 (54.17%)	0.38
90-day mortality <sup>‡</sup>			
90-day mortality, n (%)	5 (7.69%)	7 (13.73%)	0.29
sICH within 24-hours			
sICH within 24-hours, n (%)	2 (2.99%)	1 (1.96%)	1.00
ENT			
ENT, n (%)	1 (1.49%)	6 (11.76%)	0.04
<b>Healthcare resource use outcomes</b>			
<b>LOS</b>			
Total LOS, mean (IQR) <sup>§</sup>	6.22 (3.00 – 8.00)	9.56 (3.00 – 11.75)	0.03
Standard bed days, mean (IQR) <sup>  </sup>	3.08 (0.00 – 5.00)	6.46 (1.00 – 9.25)	0.03
ICU days, mean (IQR) <sup>#</sup>	3.56 (2.00 – 4.00)	3.38 (2.00 – 4.00)	0.77
<b>Additional devices used during procedure</b>			
Stent retrievers, %	0%	37.25%	NA
Aspiration devices, %	0%	1.96%	NA

\* P-values presented for the following tests: t-test and Wilcoxon rank-sum (Mann-Whitney) test for continuous variables and chi-square or Fisher's exact test for categorical variables.

<sup>†</sup> Six patients missing data for 90-day mRS.

<sup>‡</sup> Two patients missing data for 90-day mortality.

<sup>§</sup> Represents the date of discharge minus date of admission to study hospital; five patients missing data for LOS.

<sup>||</sup> Represents the normal ward days; seven patients missing data for standard bed days.

<sup>#</sup> Five patients missing data for ICU days.

Abbreviations: ENT = embolization into new territory; FPE = first pass effect; ICU = intensive care unit; IQR = interquartile range; LOS = length of stay; mRS = modified Rankin Scale; NA = not applicable; sICH = symptomatic intracerebral hemorrhage.

**Supplemental Table III. Cost differences from sensitivity analyses comparing average per-patient procedural and hospitalization-related and annual care costs for the FPE and non-FPE groups**

	US	France		Germany		Italy		Spain		Sweden		UK	
Currency (2020)	USD	€	USD*	€	USD*	€	USD*	€	USD*	SEK	USD*	£	USD*
Base-case (cost differences)													
Procedural and hospitalization-related	-6,575	-1,560	-1,833	-2,202	-2,587	-2,901	-3,409	-4,548	-5,343	-29,468	-3,364	-1,751	-2,285
Annual care	-4,116	-2,131	-2,503	NA <sup>†</sup>	NA <sup>†</sup>	-701	-823	NA <sup>†</sup>	NA <sup>†</sup>	-13,333	-1,522	-2,132	-2,783
Sensitivity analyses (cost differences)													
Alternative definitions of FPE													
FPE (mTICI 3)													
Procedural and hospitalization-related	-6,429	-1,631	-1,916	-2,230	-2,620	-3,003	-3,528	-4,599	-5,404	-26,195	-2,990	-1,662	-2,169
Annual care	-4,338	-2,115	-2,485	NA <sup>†</sup>	NA <sup>†</sup>	-809	-950	NA <sup>†</sup>	NA <sup>†</sup>	-10,683	-1,219	-2,133	-2,783
FPE (mTICI 2b-3)													
Procedural and hospitalization-related	-4,689	-1,261	-1,482	-1,871	-2,198	-2,393	-2,811	-3,878	-4,556	-17,206	-1,964	-1,119	-1,461
Annual care	-6,010	-3,141	-3,690	NA <sup>†</sup>	NA <sup>†</sup>	-1,087	-1,278	NA <sup>†</sup>	NA <sup>†</sup>	-18,941	-2,162	-3,142	-4,101
Variations in LOS around the first and third quartile <sup>‡</sup>													
LOS (first quartile)													
Procedural and hospitalization-related	-2,265	-795	-934	-486	-572	-1,170	-1,375	-923	-1,084	-3,411	-389	-581	-759
LOS (third quartile)													
Procedural and hospitalization-related	-5,696	-1,474	-1,732	-2,009	-2,360	-2,707	-3,180	-4,140	-4,864	-22,323	-2,548	-1,445	-1,885
Variations in costs													
Increased by 20%													
Procedural and hospitalization-related	-7,890	-1,872	-2,199	-2,642	-3,104	-3,482	-4,090	-5,457	-6,412	-35,362	-4,036	-2,101	-2,742
Annual care	-4,939	-2,557	-3,004	NA <sup>†</sup>	NA <sup>†</sup>	-841	-988	NA <sup>†</sup>	NA <sup>†</sup>	-15,999	-1,826	-2,559	-3,339
Decreased by 20%													

	US	France		Germany		Italy		Spain		Sweden		UK	
Currency (2020)	USD	€	USD*	€	USD*	€	USD*	€	USD*	SEK	USD*	£	USD*
Procedural and hospitalization-related	-5,260	-1,248	-1,466	-1,761	-2,069	-2,321	-2,727	-3,638	-4,275	-23,575	-2,691	-1,401	-1,828
Annual care	-3,293	-1,705	-2,003	NA <sup>†</sup>	NA <sup>†</sup>	-561	-659	NA <sup>†</sup>	NA <sup>†</sup>	-10,666	-1,218	-1,706	-2,226

Negative values indicate cost savings for the FPE group as compared with the non-FPE group.

\* Exchange rates reported for August 03, 2020, 16:00 UTC were used. The exchange rates were as follows: 1.00 EUR: 1.17 USD, 1.00 SEK: 0.11 USD and 1.00 GBP: 1.31 USD.

<sup>†</sup> Annual care costs, based on 90-day mRS, were not found for Germany and Spain.

<sup>‡</sup> LOS was varied within its IQR since this parameter was not normally distributed. Additionally, variations in LOS did not impact annual care costs.

Abbreviations: FPE = first pass effect; GBP = Great British Pound; IQR = interquartile range; LOS = length of stay; mTICI = modified Thrombolysis in Cerebral Infarction; NA = not applicable; SEK = Swedish Krona; UK = United Kingdom; US = United States; USD = United States Dollar; UTC = Coordinated Universal Time.

**Supplemental Table IV. Clinical outcomes for the FPE (mTICI 2b-3) and non-FPE (mTICI 2b-3) groups**

Outcome	FPE (mTICI 2b-3) (n=117)	Non-FPE (mTICI 2b-3) (n=93)	P-Value*
<b>Clinical outcomes</b>			
<b>90-day mRS (categorized into good and excellent functional outcomes)<sup>†</sup></b>			
90-day mRS, good outcomes (mRS 0-2), n (%)	89 (79.46%)	48 (54.55%)	<0.01
90-day mRS, excellent outcomes (mRS 0-1), n (%)	70 (62.50%)	37 (42.05%)	<0.01
<b>90-day mortality<sup>‡</sup></b>			
90-day mortality, n (%)	5 (4.42%)	12 (13.04%)	0.03
<b>sICH within 24-hours</b>			
sICH within 24-hours, n (%)	2 (1.71%)	7 (7.53%)	0.08
<b>ENT</b>			
ENT, n (%)	4 (3.42%)	10 (10.75%)	0.03
<b>Healthcare resource use outcomes</b>			
<b>LOS</b>			
Total LOS, mean (IQR) <sup>§</sup>	6.38 (3.00 – 8.00)	9.36 (3.00 – 11.00)	<0.01
Standard bed days, mean (IQR) <sup>  </sup>	3.16 (0.00 – 5.00)	7.22 (1.00 – 9.00)	<0.01
ICU days, mean (IQR) <sup>#</sup>	3.51 (2.00 – 4.00)	3.37 (1.50 – 4.00)	0.77
<b>Additional devices used during procedure</b>			
Stent retrievers, %	5.13%	30.11%	NA
Aspiration devices, %	0.85%	2.16%	NA

\* P-values presented for the following tests: t-test and Wilcoxon rank-sum (Mann-Whitney) test for continuous variables and chi-square or Fisher's exact test for categorical variables.

<sup>†</sup> Ten patients missing data for 90-day mRS.

<sup>‡</sup> Five patients missing data for 90-day mortality.

<sup>§</sup> Represents the date of discharge minus date of admission to study hospital; nine patients missing data for LOS.

<sup>||</sup> Represents the normal ward days; ten patients missing data for standard bed days.

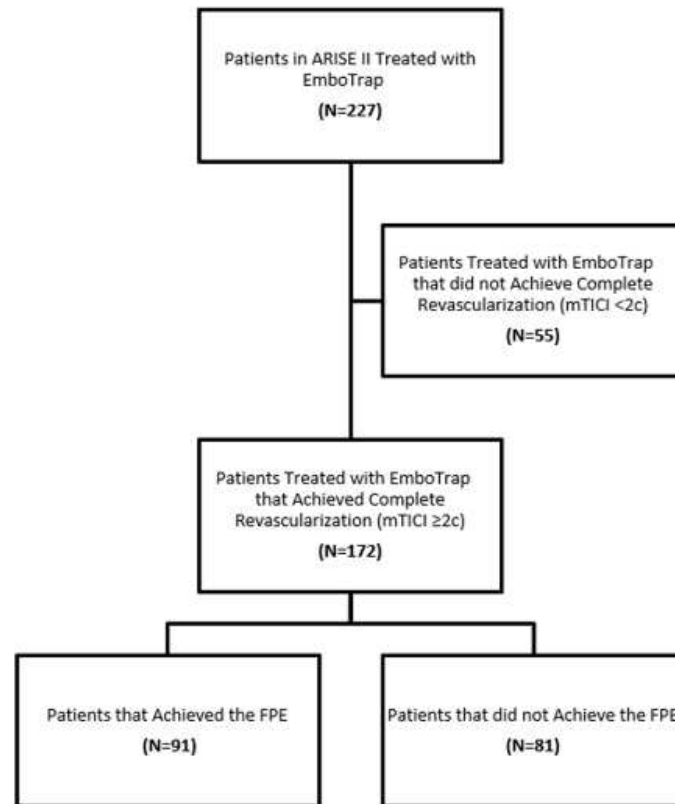
<sup>#</sup> Eight patients missing data for ICU days.

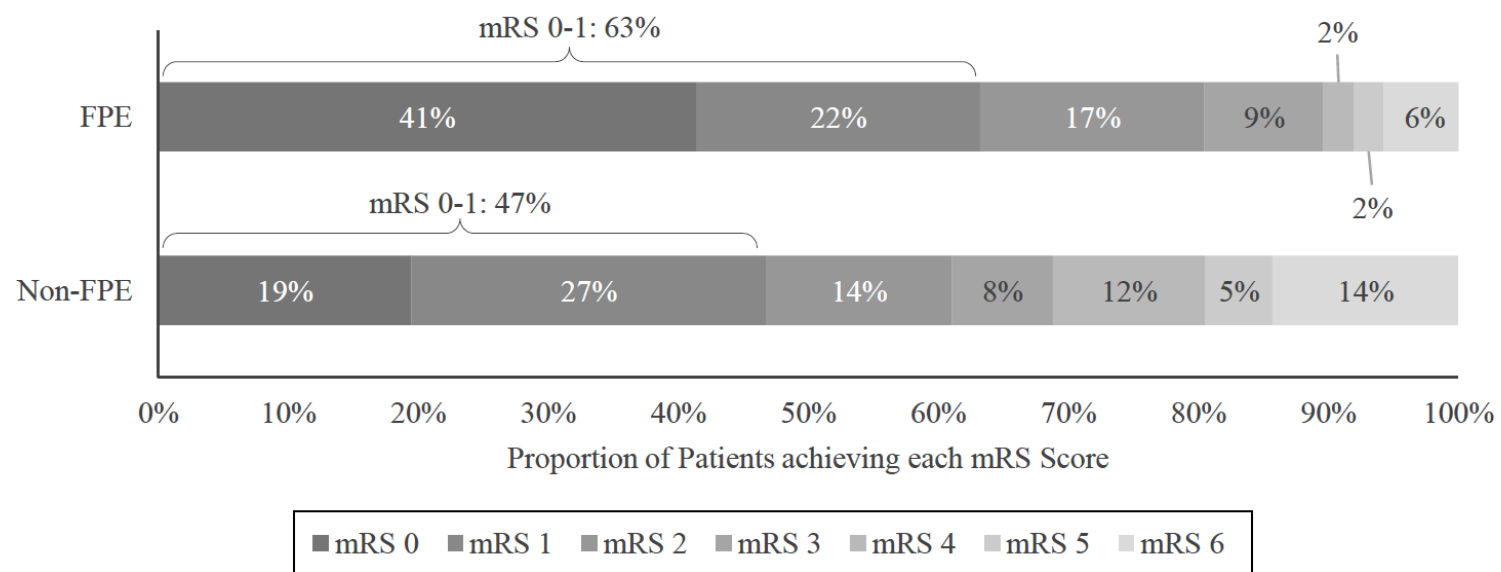
Abbreviations: ENT = embolization into new territory; FPE = first pass effect; ICU = intensive care unit; IQR = interquartile range; LOS = length of stay; mRS = modified Rankin Scale; NA = not applicable; sICH = symptomatic intracerebral hemorrhage.



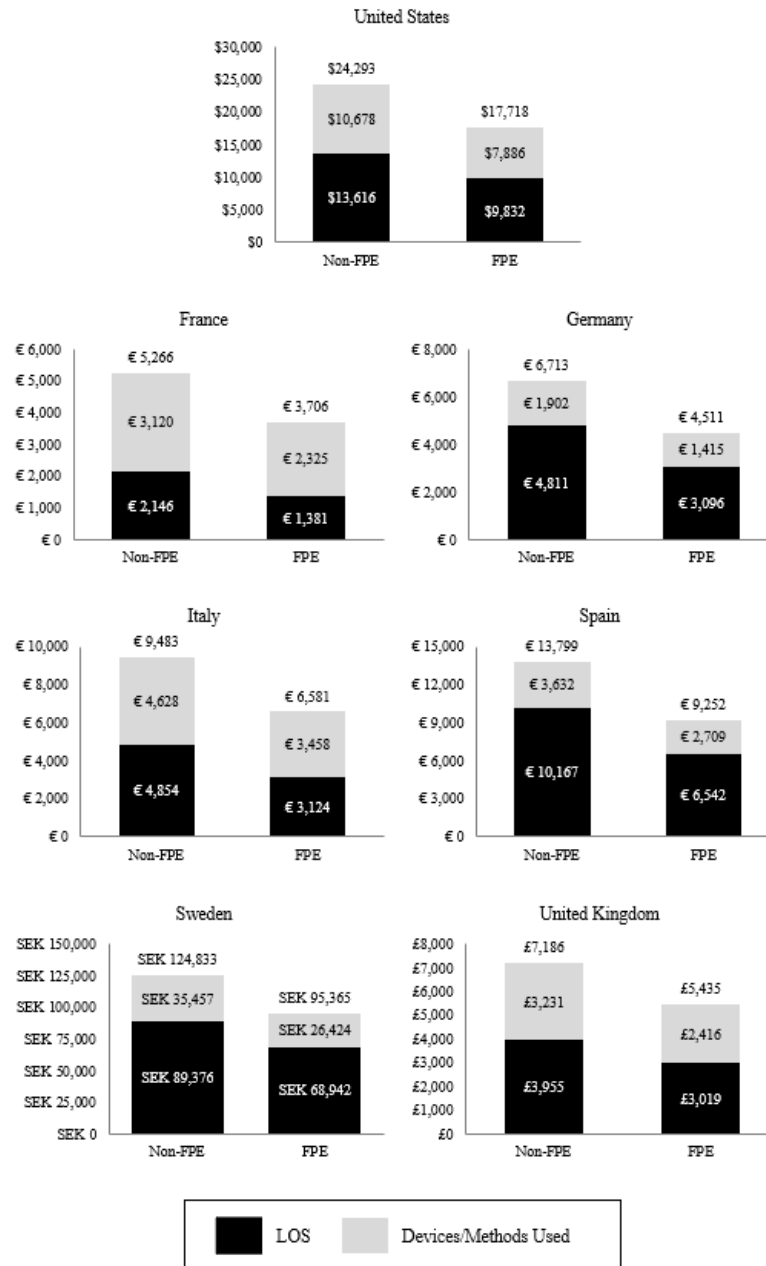
## 2.0 Supplemental Figures

### Supplemental Figure I. Patient flowchart displaying the number of patients who did or did not achieve FPE in ARISE II

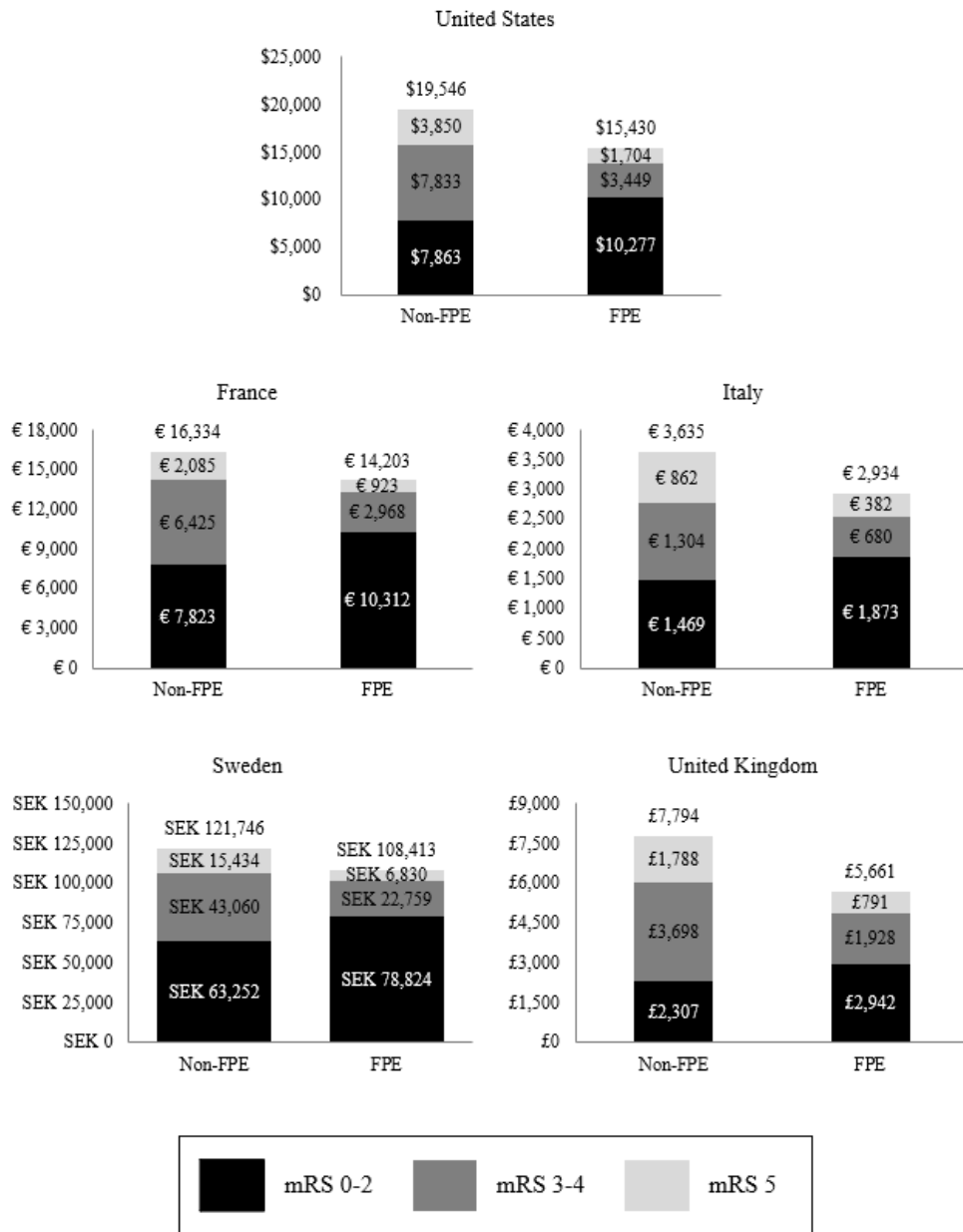


**Supplemental Figure II. Proportion of patients achieving each mRS score among the FPE and non-FPE groups**

**Supplemental Figure III. Average per-patient procedural and hospitalization-related healthcare resource use costs for the FPE and non-FPE groups**



**Supplemental Figure IV. Average per-patient annual care costs, based on 90-day mRS, for the FPE and non-FPE groups**



## References

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