

THE ECONOMIC BURDEN OF MIGRAINE IN SPAIN: A NATIONWIDE COST-OF-ILLNESS APPROACH FROM THE YEAR 2020 EUROPEAN HEALTH SURVEY IN SPAIN

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Background and objective

- Migraine is a chronic sometimes highly disabling neurological disease that manifests itself with recurrent episodes of headache [1]. The prevalence of migraine has been estimated between 10-16% (in Spain 12.6%), being higher in women than in men [2-4].
- Migraine not only has a strong impact at the economic level but also at societal and sanitary, representing the second leading cause of neurological disability in the world [5]. Thus, it is expected that migraine is associated with a hugely healthcare and non-healthcare resources consumption, and, as a consequence, high economic impact to both society and national healthcare systems [6].
- Spanish migraine cost data published to date have used convenience samples with little representativeness and, in none of them, cost differences were estimated in migraineurs versus non-migraineurs [7].
- This study estimated the cost-of-illness (COI) of migraine from the perspective of Society in Spain, and characterized the excess cost of migraineurs versus non-migraineurs.

Methods

- A cross-sectional study was designed using existing disaggregated and anonymized data (bottom up approach) with national representativeness in the year 2020: The nationwide cross-sectional year-2020 European-Health-Survey-in-Spain (EHSS)[8].
- Abstracted data of migraineurs and non-migraineurs both gender, 15+ years old, were obtained by propensity score optimal matching [9].
- Migraineurs were identified in the database of EHSS when respondent answered consecutively yes first in the survey question asking the interviewee if they have had a migraine in the past 12 months and then if a physician has told he/she have a migraine.
- COI accounted healthcare resources utilization (HRU) funded by both the National Health System (NHS) and the participant, and non-HRU (absenteeism, presenteeism, unemployment and premature retirement)[10].
- Human capital method was applied to estimate indirect costs, while healthcare costs were computed by multiplying HRU frequency by its unitary price according to regional tariffs weighted by its geographical population density or reference prices in case of drugs for migraine [10].
- Costs were expressed as Per-Patient-Per-Year (PPPY) in Euros year 2020.
- Excess cost in migraineurs related to non-migraineurs were estimated by means of a Univariate General Linear model with robust standard error estimation for differences when applicable and using covariates not included in the propensity score calculation.
- Subgroups (by gender and age) and sensitivity analysis (modifying the precision of caliper in propensity score calculation, 1:1 matching and not using propensity score) were also carried out to control for possible uncertainty of base case analysis [10].

Results

- Data of persons 15+ years old were abstracted from the EHSS database; 1,442 migraineurs (77.3% women, 52.5 years) and 4,288 non-migraineurs (76.7% women, 52.8 years) obtained by propensity score optimal matching (Table 1). Most HRU and non-HRU were significantly higher in migraineurs than in non-migraineurs, regardless the type of resource (Table 2). PPPY cost was double in migraineurs; €5,861 vs €2,979; excess cost of €2,882 (95% CI: 2,410-3,354, p<0.001), mainly attributable to the higher lost in labor productivity cost; €1,929 (1,532-2,326, p<0.001), accounting by 66.9% of total excess cost, while cost funded by NHS represented the 29.0% of total excess cost (Figures 1 to 4). Subgroup and sensitivity analyses supported the robustness of base case findings (Figures 5 to 7).

Table 1. Demographics characteristics of sample analyzed by migraine status.

		Non-migraineurs (n=4,288)	Migraineurs (n=1,442)	p
Age (years)		52.8 (18.1)	52.5 (17.9)	0.544
Age group (years)				
	15-24	6.2%	6.0%	
	25-34	9.4%	9.6%	
	35-44	19.0%	19.5%	
	45-54	20.3%	20.7%	0.996
	55-64	19.1%	18.9%	
	65-74	12.5%	12.2%	
	75+ years	13.5%	13.0%	
Gender	Woman	76.7%	77.3%	0.668
Accident in prior 12 months	Yes	9.5%	10.9%	0.137
Civil status	Single	26.9%	24.5%	
	Married	50.6%	53.1%	
	Widower	13.2%	13.0%	0.105
	Separated	3.0%	2.1%	
	Divorced	6.3%	7.2%	
	Illiterate	0.7%	1.3%	
	Incomplete primary schooling	8.5%	10.7%	
	Primary schooling	16.7%	16.0%	
Education level	Secondary schooling	21.2%	25.2%	<0.001
	Bachelor	13.5%	12.4%	
	Labor trainee	6.6%	8.8%	
	High labor trainee	8.7%	9.4%	
	University	24.2%	16.1%	
	None	34.2%	42.8%	
Physical activity	Occasional	39.9%	36.9%	<0.001
	Several times per month	9.6%	8.4%	
	Several times per week	16.3%	11.9%	
	Daily or almost daily	11.6%	8.6%	
	5-6 days per week	1.1%	1.1%	
	3-4 days per week	6.0%	4.2%	
	1-2 days per week	15.4%	12.2%	
Alcohol consumption (days/month)	2-3 days per week	9.9%	8.6%	<0.001
	Once a month	8.1%	7.9%	
	Less than once a month	12.4%	14.1%	
	None in last 12 months	11.7%	16.8%	
	Never	23.8%	26.5%	
Smoking (daily)	Yes	19.4%	20.2%	0.715

Table 2. Healthcare and non-healthcare resources utilization by migraine status.

	Migraine		Difference ^b (CI)	(95% p
	No (n=4,288)	Yes (1,442)		
Healthcare resources utilization				
PC primary care visits	3.87 (0.17)	7.36 (0.30)	3.49 (2.68;4.29)	<0.001
Specialist medical visits ¹	1.89 (0.14)	3.91 (0.23)	2.03 (1.33;2.72)	<0.001
Emergency-room visits	0.50 (0.03)	0.99 (0.04)	0.47 (0.34;0.60)	<0.001
Hospitalization (days)	0.63 (0.09)	1.16 (0.16)	0.53 (0.02;1.05)	0.042
Diagnostic and analytic tests ²	1.33 (0.02)	1.84 (0.03)	0.51 (0.43;0.58)	<0.001
Difference (%)				
Physiotherapy	20.0 (18.8;21.2)	29.8 (27.4;32.1)	9.8	<0.001
Psychiatry	4.5 (3.9;5.1)	13.0 (11.2;14.7)	8.5	<0.001
Ambulatory nursing care	18.3 (17.2;19.5)	26.1 (23.8;28.3)	7.8	<0.001
Psychotherapy	3.7 (2.9;4.5)	10.2 (7.8;12.6)	6.5	<0.001
Homeopathy	0.6 (0.3;0.9)	1.1 (0.3;2.0)	0.5	0.458
Acupuncture	1.1 (0.6;1.5)	3.1 (1.7;4.4)	2.0	<0.001
Natural medicine	1.1 (0.7;1.6)	1.8 (0.7;2.8)	0.7	0.215
Labor productivity lost ³				
Difference ^b (CI)				
Days off-work (absenteeism)	10.32 (1.05)	32.66 (1.90)	22.35 (16.12;28.57)	<0.001
Presenteeism (%) ⁴	5.60 (0.22)	14.25 (0.40)	8.65 (7.55;9.75)	<0.001
Unemployment rate (%)	13.5 (12.1;14.8)	21.6 (18.8;24.5)	8.1%	<0.001
Premature retirement (%) ⁵	2.3 (1.8;2.7)	3.3 (2.4;4.3)	1.0%	0.042

Data expressed as mean (standard error) or in % of patients using the resource with their 95% CI. CI: Confidence interval. PC: Primary care. ¹Includes radiography, CAT scan, EEG/EEG, magnetic resonance imaging, ultrasound and other diagnostic, ultrasonography. ²For migraineurs and non-migraineurs attack in the workplace. ³Expressed as an average % of a standard working day; ⁴prevalence at age 65; ⁵mean and difference of years lost by disability score and covariates.

Figure 5. PPPY total cost and excess cost according to gender.

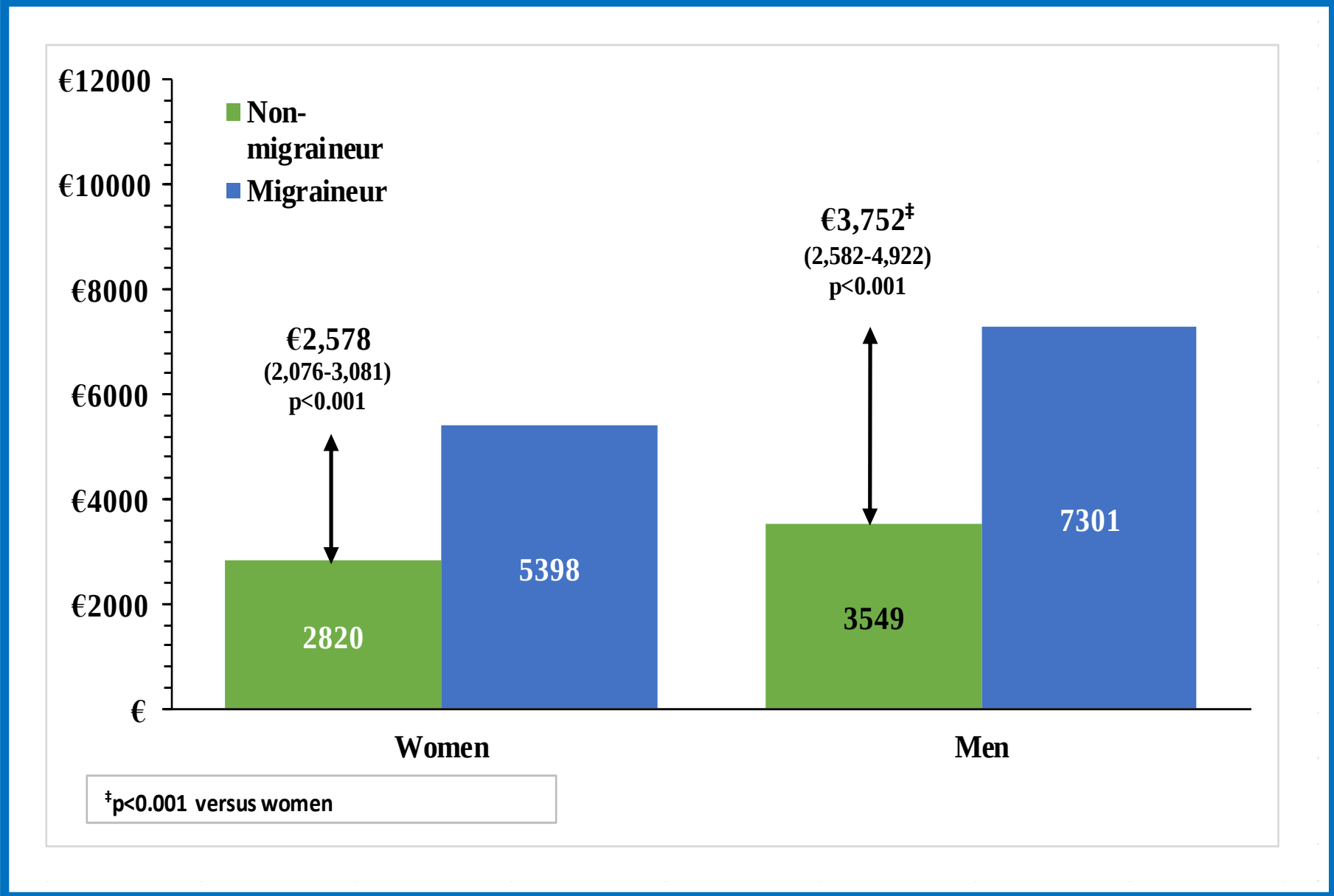


Figure 6. PPPY total cost and excess cost according to age strata.

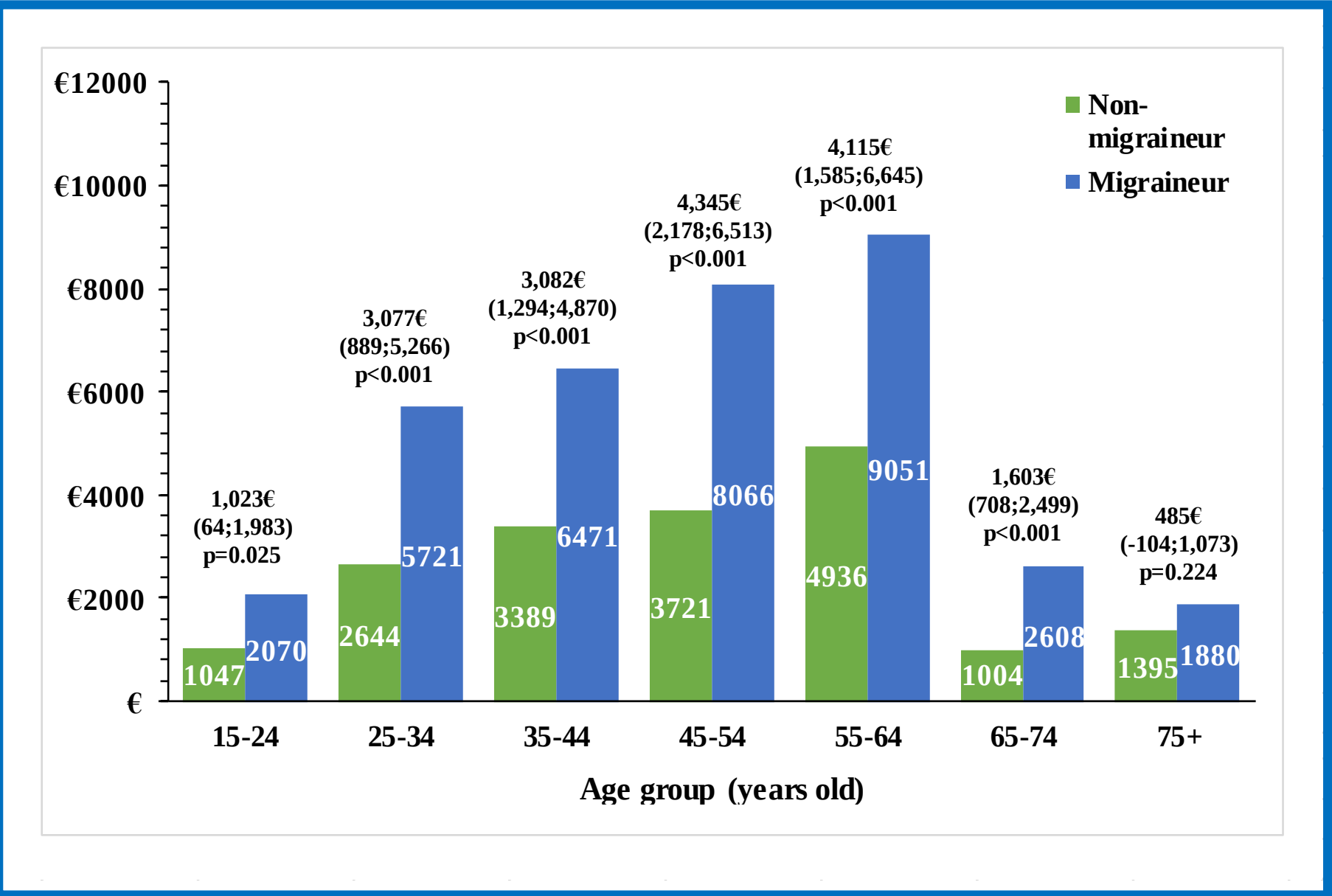
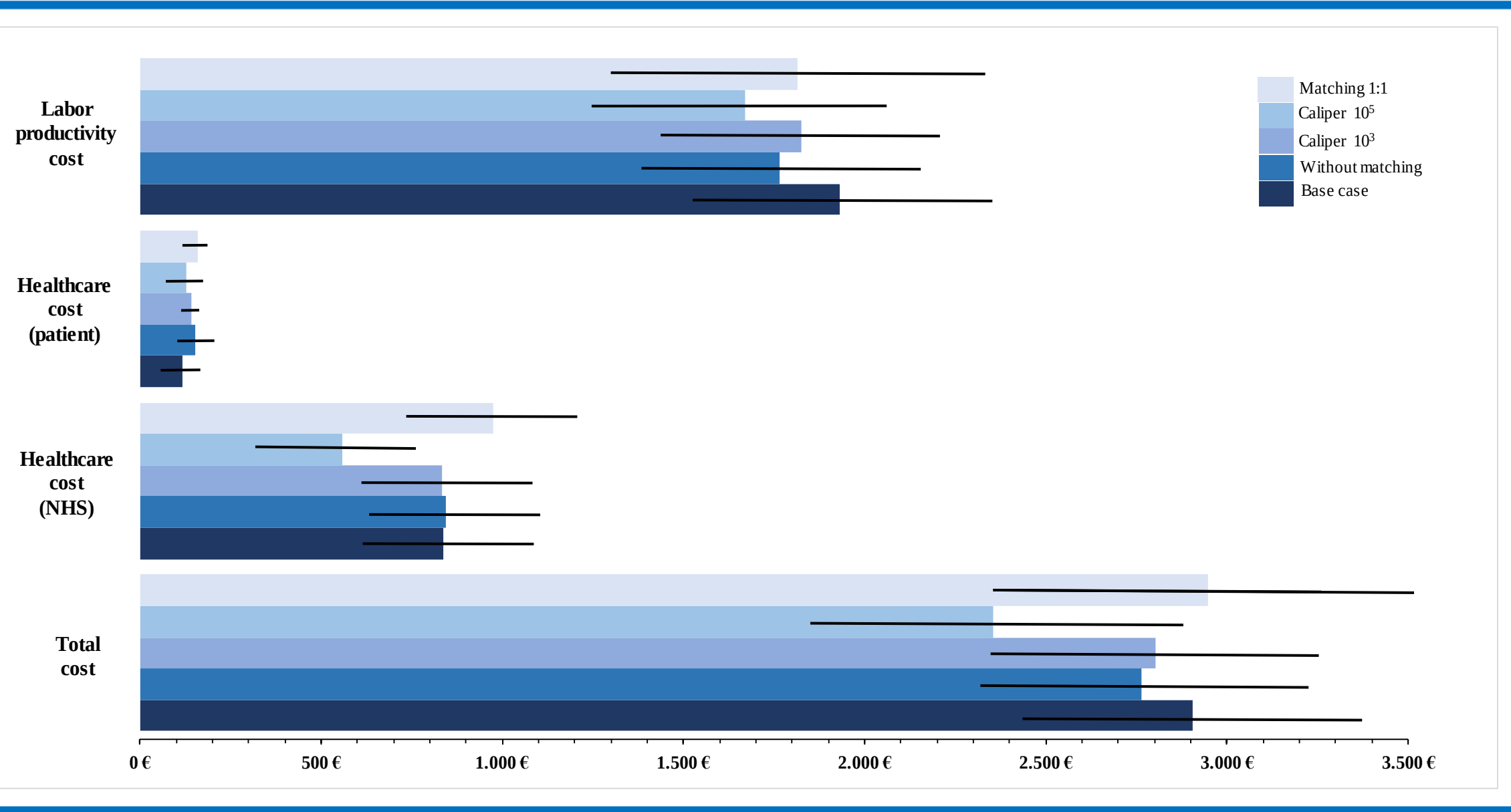


Figure 7. Sensitivity analysis: PPPY excess cost, total and in main components in alternative scenarios.



Conclusions

- In Spain, from a nationwide society perspective, migraineurs showed a meaningful per-patient-per-year excess cost compared with non-migraineurs.
- As in many other developed countries, most of the excess cost was driven by labor productivity lost, significantly higher in men than in woman and in age groups between 25 to 64 years old.
- Given that it is expected to have about 3.5 million diagnosed migraineurs in Spain, the overall economic impact was estimated to be above 10,400 million Euros in year 2020.

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