Direct Healthcare Costs (HCCs) Inequalities Associated With Myasthenia Gravis (MG) in Hungary: Claims Database Analysis

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INTRODUCTION

Healthware Ltd.'s ISPOR 2024 poster revealed the raw demographics of the MG patient population in Hungary, as well as the direct treatment costs and expenditure by function.[1] The aim of this research is to examine major disparities in direct health spending, as well as the demographic and morbidity characteristics of patient groups segmented based on costs.

METHODS

The analysis of the NHIF (National Health Insurance Fund) claims database was conducted using anonymised data.

- The NHIF database covers all reimbursement events and the main demographic data of the patients with the full coverage of Hungary 9,6 million population.

- The research period: January 1, 2017, to December 31, 2024.

- The results were summarised using descriptive, unadjusted statistics using PL/SQL Developer 14.0.

- Costs are based on official list prices. Drug costs doesn't contain the rebates.

- All cost are calculated to the average euro (€) exchange rate from January to December 2024 (€1 = 395,20 HUF).

- The therapeutic and coding habits were carried out with the involvement of a leading hospital neurologist.

- Limitation: no individual patient level can be provided. Instead, it provides only aggregated data.

- The inclusion criteria are exactly the same as those we used in previous research.[1]

CONCLUSIONS

The initial results of the research study on MG in Hungary indicate that the associated costs of MG treatment are highly concentrated. Patients were classified into five groups based on their costs. The results reveal that just 1.5% of patients account for 20% of total public expenditure, while over 70% of patients fall into the first group. This indicates a nearly fiftyfold difference between the average and median expenditure. Using a decile classification would further increase this disproportion, with only 0.6% of patients accounting for the final 10% of expenditure.

Taking previous poster results[1] into account, it can be concluded that MG patients in Hungary can be divided into two distinct financing groups:
- a significant proportion of older patients with higher comorbidity whose treatment can be considered stable with standard, low-cost treatments; and
- a very small group of young patients with lower comorbidity who generate extremely high healthcare costs, primarily due to intensive hospital care and high-cost drug treatments.

RESULTS

Direct Healthcare Costs density

The study identified 2,484 patients with MG , who were then sorted in ascending order based on direct healthcare expenditures and subsequently divided by sex and into five equal groups (quintiles) according to the amount spent.

Sex	Desciptive statistics	Groups by cost density - for the whole study period				
		1	2	3	4	5
All patients	Number of patients	1 762	417	173	95	37
	Sum cumulated cost	1 382 248 €	2 763 361 €	4 145 920 €	5 512 329 €	6 912 623 €
	Average cost	785 €	3 312 €	7 992 €	14 383 €	37 846 €
	Median cost	708 €	2 924 €	7 864 €	13 815 €	34 218 €
	Number of patients cumulated %	70,9%	16,8%	7,0%	3,8%	1,5%
	Cumulated cost %	20,0%	40,0%	60,0%	79,7%	100,0%
Male	Number of patients	817	195	78	36	12
	Sum cumulated cost	631 326 €	1 278 857 €	1 908 177 €	2 422 428 €	2 844 694 €
	Average cost	773 €	3 321 €	8 068 €	14 285 €	35 189 €
	Median cost	665 €	2 987 €	7 883 €	13 296 €	33 266 €
	Number of patients cumulated %	71,8%	17,1%	6,9%	3,2%	1,1%
	Cumulated cost %	22,2%	45,0%	67,1%	85,2%	100,0%
Female	Number of patients	945	222	95	59	25
	Sum cumulated cost	750 922 €	1 484 505 €	2 237 743 €	3 089 901 €	4 067 929 €
	Average cost	795 €	3 304 €	7 929 €	14 443 €	39 121 €
	Median cost	742 €	2 888 €	7 787 €	14 032 €	34 746 €
	Number of patients cumulated %	70,2%	16,5%	7,1%	4,4%	1,0%
	Cumulated cost %	18,5%	36,5%	55,0%	76,0%	100,0%
Female ratio		54%	53%	55%	62%	68%

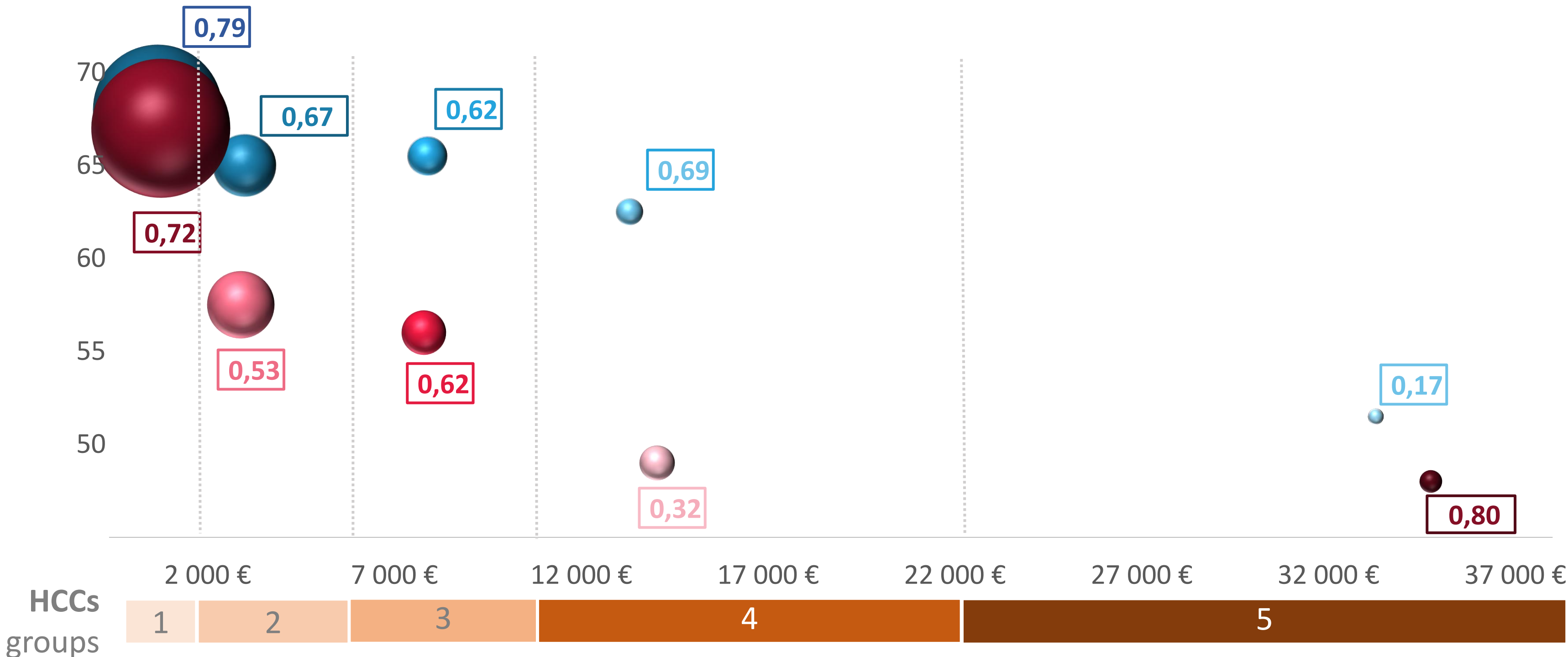| Gini coefficient		
All patients	Male	Female
0,60	0,58	0,63
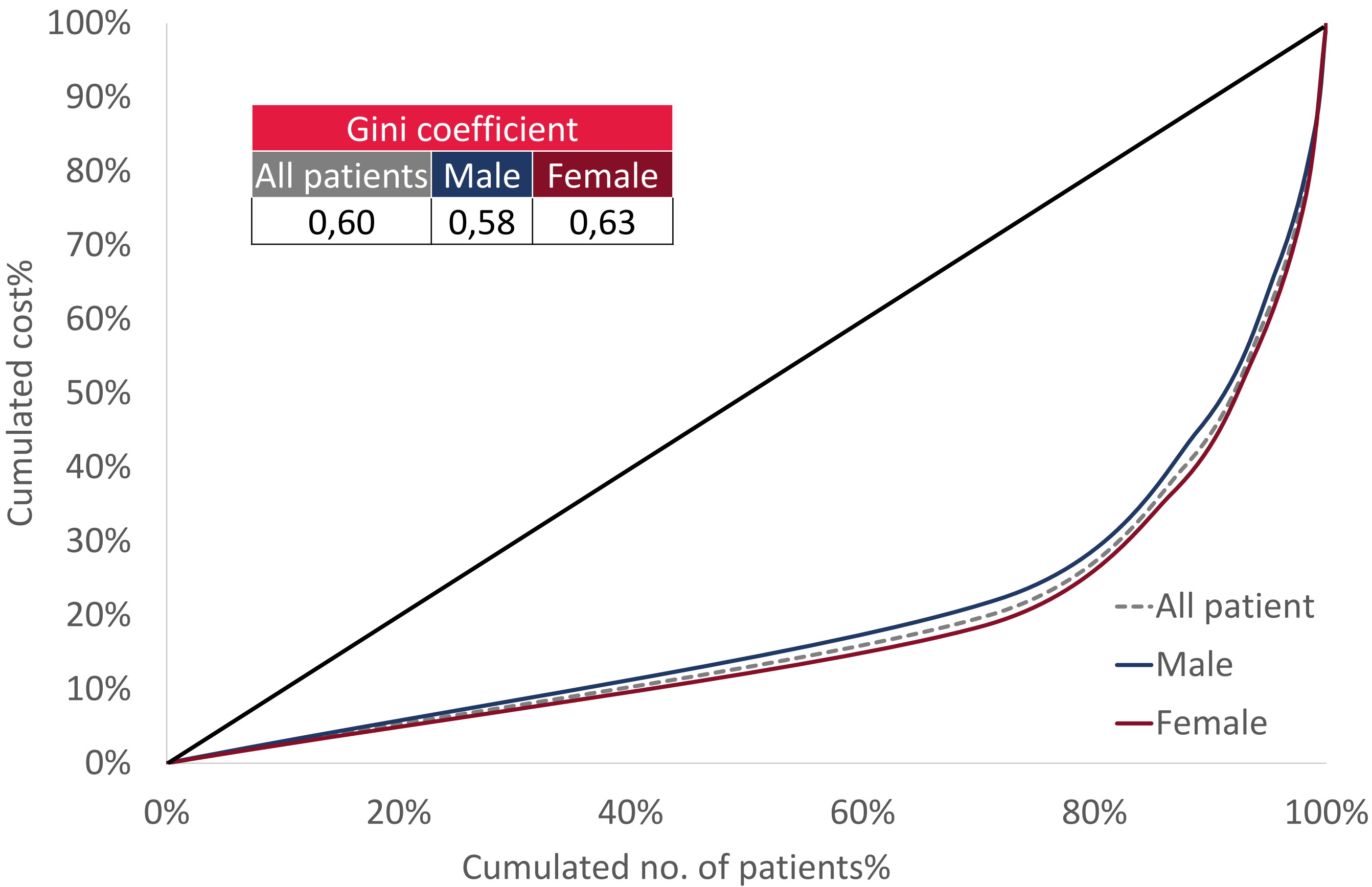
The distribution of costs indicates significant disparities among MG patients. A mere 1.5% of patients account for 20% of total expenditure in the group with the highest cost outflow (1.1% in the male subgroup and 1% in the female subgroup). The data show a substantial increase, with the average and median cost quintiles for both women and men exhibiting a roughly fiftyfold disparity between the first and fifth quintiles. This substantial inequality is evident in the Lorenz curves and the Gini index, with the male-female disparity being slightly more pronounced.

Age and comorbidity differences by Sex

In the case of groups separated by cost, we examined whether there were large differences in the average and median age and comorbidity of each group. The presence of comorbidity was characterised by the average value of the well-established Charlson Comorbidity Index metric used in healthcare research.

Sex	Descriptive statistics	Groups by cost density - for the whole study period				
		1	2	3	4	5
All	Age avg	62,9	58,9	58,0	53,5	51,4
	Age median	67,5	63,0	63,0	59,0	49,0
Male	Age avg	64,6	62,9	63,5	59,7	53,9
	Age median	68,0	65,0	65,5	62,5	51,5
Female	Age avg	61,4	55,3	53,5	49,8	50,1
	Age median	67,0	57,5	56,0	49,0	48,0
All	Charlson comorbidity index avg.	0,75	0,59	0,62	0,46	0,59
Male		0,79	0,67	0,62	0,69	0,17
Female		0,72	0,53	0,62	0,32	0,80

On the bubble chart the x-axis represents the cost cohorts with the median cost, the y-axis the median ages characteristic of the subgroups, and the size of each bubble indicates the number of patients. To represent the presence of comorbidity, a color scale was employed, with darker tones signifying more severe cases. For male subjects, blue was utilized as the color indicator, while burgundy was used for female patients.

[1]https://healthware.hu/application/files/4017/3201/1275/Direct_healthcare_costs_associated_with_Myasthenia_Gravis.pdf

Key findings:

- Notable disparities emerge among the cohorts with respect to both age and comorbidity indicators.

- Direct healthcare expenditure related to the fifth cohort is notably higher than for the population as a whole.

- Moderately robust negative correlations are observed between age, comorbidity indicators and median cost for both female and male subgroups. In the context of the highest cost group, it is important to acknowledge that a limited number of elements can substantially influence the outcome due to the presence of a single outlier value.

- The demographic data reveals that, overall, the female population is younger than the male population.