

Clinical and Economic Burden of Employees Who Are Care Partners of Patients with Multiple Sclerosis

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Acknowledgements: Writing and editorial was provided by Erich Junge and Phoebe Sadler of Ashfield MedComms (New York, NY, USA) and was funded by EMD Serono, Rockland, MA, USA (CrossRef Funder ID: 10.13039/100004755). The authors had full control of the poster and provided their final approval of all content

Disclosures:

BH received funding support from EMD Serono. **RAB** is an employee of Better Health Worldwide, Inc. **IB** is an employee of Workpartners, LLC. Workpartners, LLC received funding from EMD Serono to conduct the study. **NK** is a consultant for Workpartners, LLC. Workpartners, LLC received funding from EMD Serono to conduct the study. **ALP** and **CL** are employees of EMD Serono, Rockland, MA, USA.

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CONCLUSIONS

Employee care partners with spouses/partners with MS had significant comorbidities and direct and indirect costs that varied with MS severity. This real-world, health claims database study demonstrated the need to better understand the care partner's wellness in the management of a chronic condition like MS.

INTRODUCTION

- MS is a chronic disease requiring long-term care
- It is estimated that 80% of the care for patients with MS is provided by informal unpaid care partners¹
- Although previous studies have evaluated the burden among care partners of patients with MS,¹⁻³ there has been very limited research with objective data on employee care partners of patients with MS
- Furthermore, data on the indirect costs of MS are not commonly available in the US
- Employers, health care providers, and care partners will benefit from an improved understanding of the impact of MS on care partners

OBJECTIVE

To evaluate the 1-year clinical and economic impact on employee care partners of patients with MS by disease severity

METHODS

Study Population

- Employees with spouses/partners with MS from the Workpartners Research Reference Database (RRDb) (1/1/2010–12/31/2019) were eligible if: spouse/partner had ≥ 3 MS-related (ICD-9-CM/ICD-10-CM:340.xx/G35) inpatient/outpatient/disease-modifying therapy claims within 1-year (latest claim=index date); 6-month pre-/1-year post-index enrollment; and age 18–64. Any employees that had MS were excluded

Analyses

- Patients were categorized as mild/moderate/severe based on post-index symptoms: bladder/bowel, psychiatric, cognitive, and physical function
- Costs were calculated using two-stage logistic and generalized linear model regression
- Chi-square tests evaluated demographic/clinical characteristic and 12-month direct/indirect costs differences between categorical variables, and t-tests evaluated differences in continuous variables
- A *P*-value of <0.05 was used to determine statistical significance. *P*-values were not adjusted for multiplicity

RESULTS

- Among 1041 employee care partners, 358 (34.4%) spouses/partners had mild MS, 491 (47.2%) moderate MS, and 192 (18.4%) severe MS (**Table 1**)
- Mean [SE] care partner age was 49.0 [0.5] mild, 50.5 [0.4] moderate, 51.7 [0.6] severe; percentage [SE] female was 24.6% [2.3%] mild, 19.8% [1.8%] moderate, 27.6% [3.2%] severe; and mean [SE] care partner CCI scores 0.28 [0.05] mild, 0.30 [0.04] moderate, 0.27 [0.06] severe (**Table 1**)

Table 1. Baseline demographic and clinical characteristics of patients with MS and employee care partners

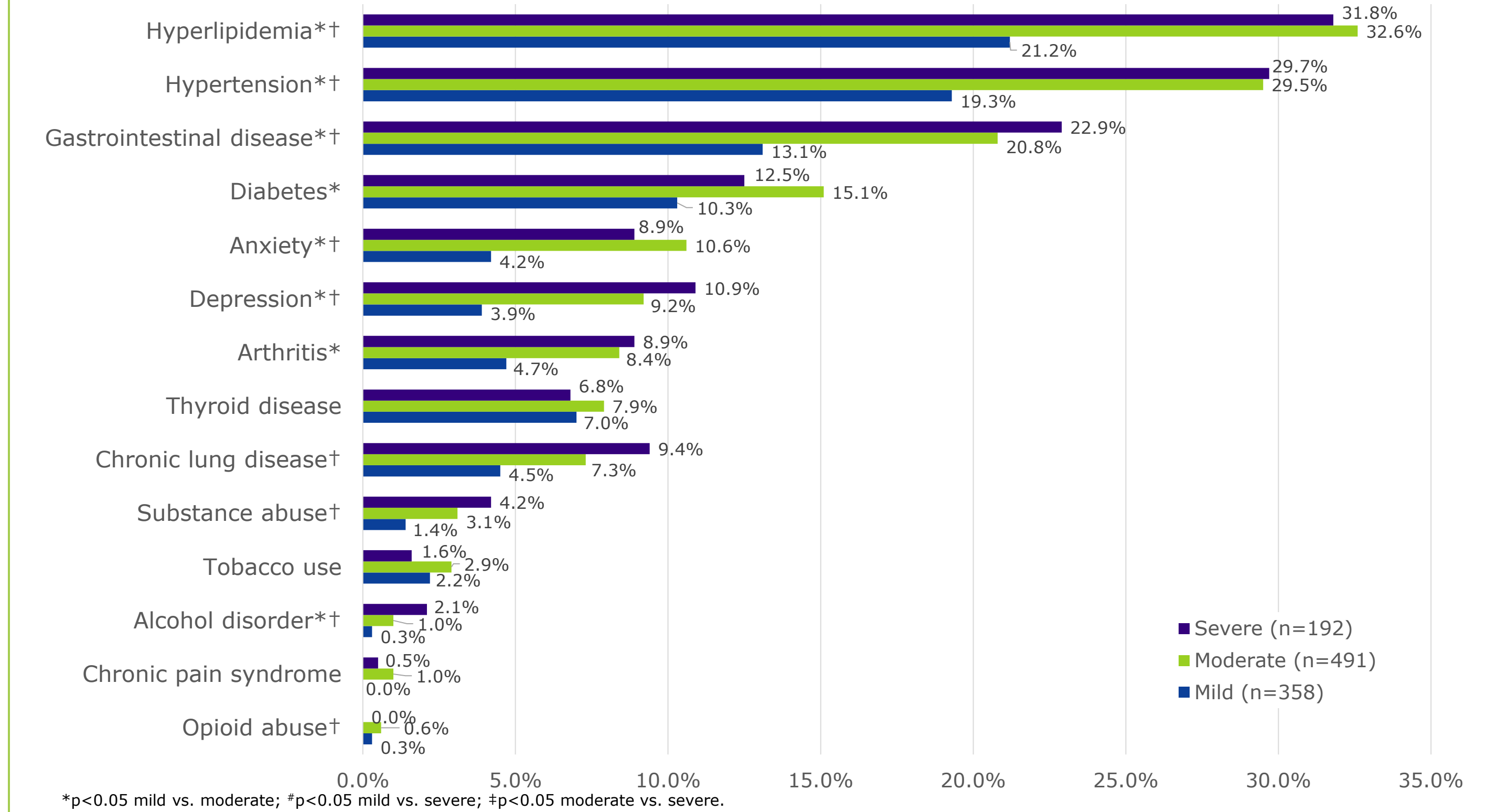
	Mild (n=358)		Moderate (n=491)		Severe (n=192)	
	Mean/%	S.E.	Mean/%	S.E.	Mean/%	S.E.
Patients with MS						
Age (years)	47.9*†	0.51	49.7*	0.41	50.7†	0.66
Gender (% female)	76.3%	2.3%	80.2%	1.8%	73.4%	3.2%
CCI score	0.34*†	0.04	0.55*	0.06	0.74†	0.10
Care partners (employees)						
Age (years, at index date)	49.0*†	0.50	50.5*	0.41	51.7†	0.64
Gender (% female)	24.6%	2.3%	19.8%†	1.8%	27.6†	3.2%
Race						
White	25.7%	2.3%	31.8%	2.1%	24.5%	3.1%
Black	3.1%	0.9%	2.2%	0.7%	2.6%	1.2%
Hispanic	5.6%*	1.2%	2.9%*	0.8%	4.2%	1.4%
Other race	1.7%	0.7%	1.0%	0.5%	0.0%	0.0%
Missing	64.0%	2.5%	62.1%	2.2%	68.8%	3.4%
Region (1st digit of zip code)						
0	9.5%*	1.6%	5.5%*	1.0%	5.7%	1.7%
1	10.6%†	1.6%	9.4%†	1.3%	17.7%†*	2.8%
2	6.7%*	1.3%	11.2%*	1.4%	7.3%	1.9%
3	8.1%	1.4%	10.4%	1.4%	8.9%	2.1%
4	6.7%	1.3%	6.7%	1.1%	8.3%	2.0%
5	9.0%†	1.5%	7.7%	1.2%	4.2%†	1.4%
6	6.4%	1.3%	7.5%	1.2%	9.4%	2.1%
7	14.3%	1.9%	14.7%	1.6%	14.1%	2.5%
8	13.7%	1.8%	14.3%	1.6%	9.9%	2.2%
9	14.8%	1.9%	12.6%	1.5%	14.6%	2.6%
Job-related variables						
Annual salary	\$110,249	\$12,597	\$91,816	\$3457	\$80,735	\$4586
Full-time employment	79.6%	2.1%	82.9%	1.7%	83.9%	2.7%
Exempt	42.2%	2.6%	43.2%	2.2%	41.7%	3.6%
Employee tenure (years)	11.1	0.52	11.4	0.43	11.8	0.73
CCI score	0.28	0.05	0.30	0.04	0.27	0.06

Bolded values indicate statistically significant differences between groups. **p*<0.05 mild vs. moderate; †*p*<0.05 mild vs. severe; ‡*p*<0.05 moderate vs. severe.

RESULTS

- More care partners of moderate/severe vs. mild patients had hyperlipidemia (32.6%/31.8% vs. 21.2%), hypertension (29.5%/29.7% vs. 19.3%), gastrointestinal disease (20.8%/22.9% vs. 13.1%), depression (9.2%/10.9% vs. 3.9%), and anxiety (10.6%/8.9% vs. 4.2%) (**Figure 1**)

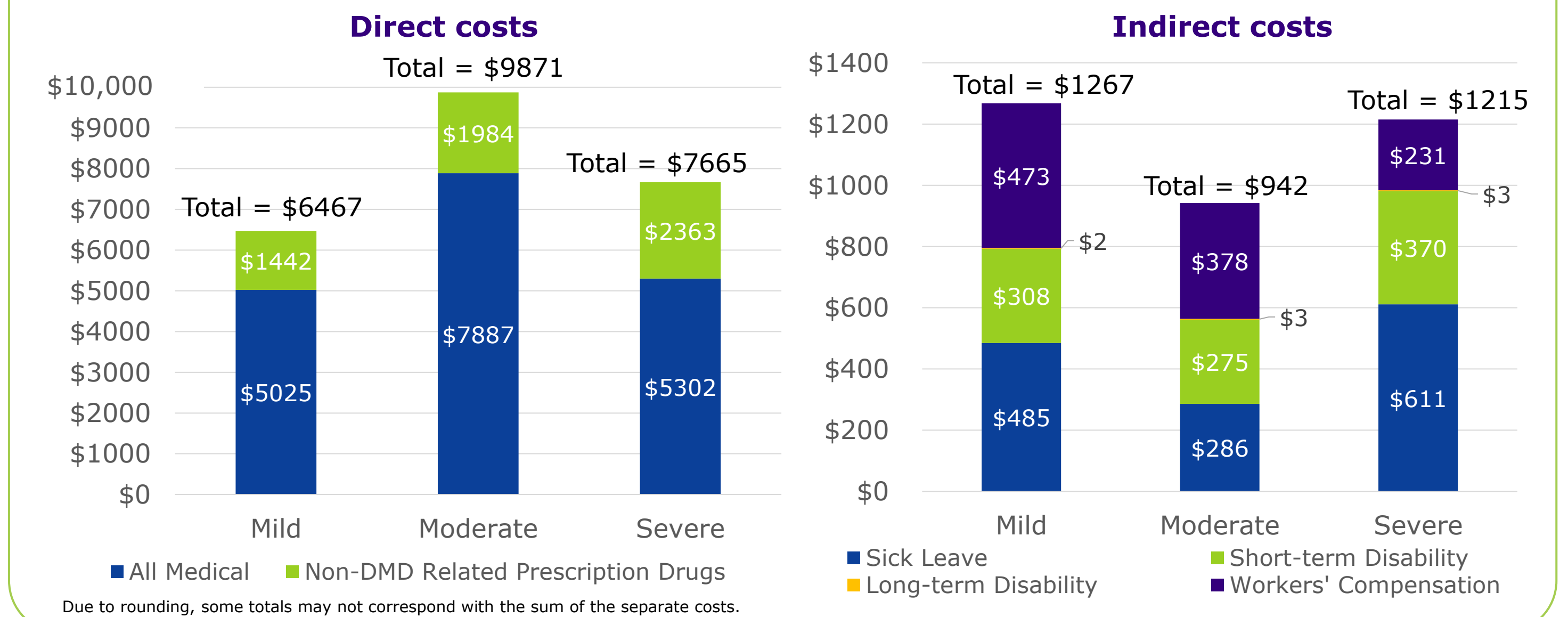
Figure 1. Comorbidities during 1-year follow-up for employee care partners by patients' MS disease severity category



**p*<0.05 mild vs. moderate; †*p*<0.05 mild vs. severe; ‡*p*<0.05 moderate vs. severe.

- Adjusted mean [SE] medical costs were greater for partners of moderate vs. mild/severe patients (\$5025 [\$390] mild, \$7887 [\$518] moderate, \$5302 [\$561] severe; both *p*<0.001) (**Figure 2**)
- Pharmacy costs [SE] were lower for partners of mild vs. severe/moderate patients (\$1442 [\$126] mild, \$1984 [\$145] moderate, \$2363 [\$278] severe; both *p*<0.005) (**Figure 2**)
- Sick leave costs [SE] were greater for partners of mild/severe vs. moderate patients (\$485 [\$76] mild, \$286 [\$45] moderate, \$611 [\$130] severe; both *p*<0.05) (**Figure 2**)

Figure 2. Direct and indirect costs over 1-year follow-up for employee care partners by disease severity category of spouse/partner with MS



Due to rounding, some totals may not correspond with the sum of the separate costs.

Abbreviations: CCI, Charlson Comorbidity Index; DMT, disease-modifying therapy; ICD-9/10-CM, International Classification of Diseases, Ninth/Tenth Revision, Clinical Modification; MS, multiple sclerosis; RRDb, Workpartners Research Reference Database; SE, standard error.

References: 1. Hillman L. *Phys Med Rehabil Clin N Am.* 2013;24(4):619-27; 2. Santos M, et al. *Disabil Health J.* 2019;12(4):628-34; 3. Gupta S, et al. *Int J MS Care.* 2012;14(4):179-87.

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Presented at the Consortium of Multiple Sclerosis (CMSC) 2021 Congress | 25 – 28th October

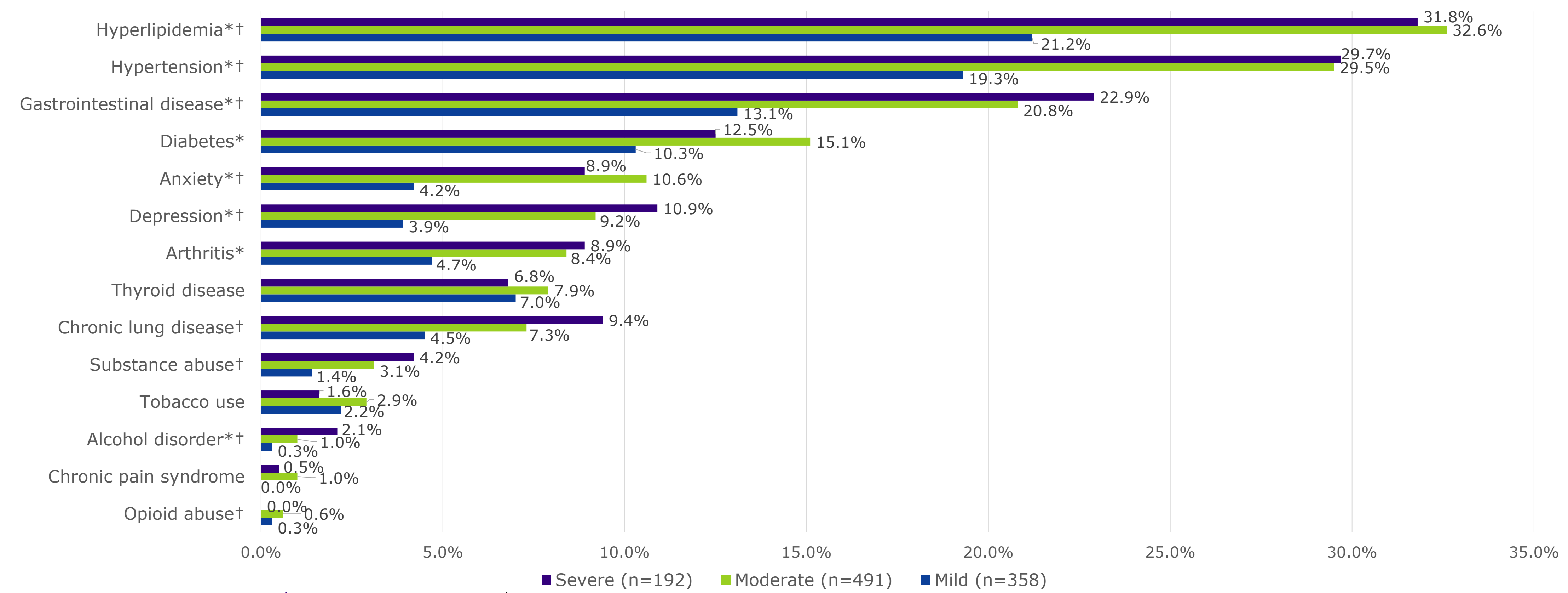
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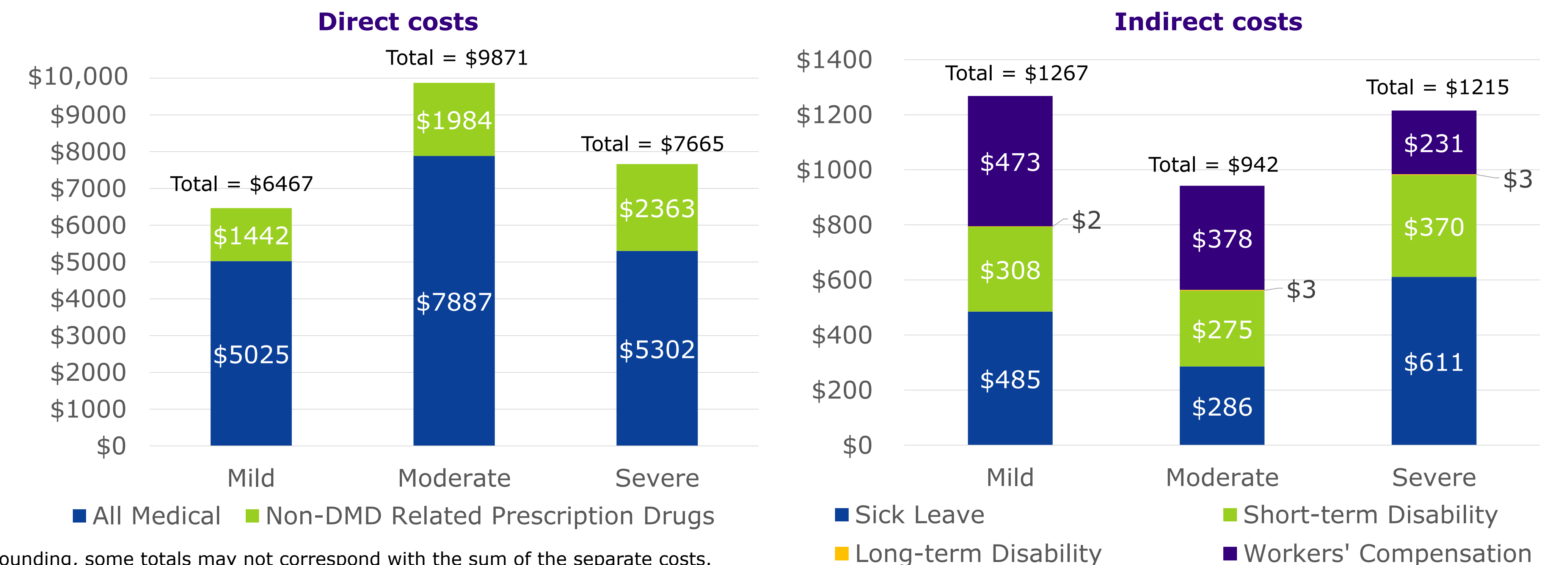
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