Out-of-Pocket Spending Inequity Among High-Deductible Health Plan Members with Bipolar Disorder

KEY WORDS: health insurance; inequity; bipolar disorder; high-deductible health plans; out-of-pocket spending.

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Almost 3% of people in the USA have bipolar disorder, a serious mental illness characterized by acute episodes of mania, hypomania, and depression.[1] In 2019, over half of employer-sponsored insurance enrollees had high-deductible health plans (HDHPs) that require potential out-of-pocket payments of ≥$1000 per year.[2] We studied out-of-pocket burdens among people with bipolar disorder because they require consistent access to expensive specialist care and medications, placing them at risk for concerning reductions in health care use[3] and burdensome expenses. Furthermore, previous studies have not examined cost sharing inequity among people with serious mental illness.

METHODS

We drew our commercially insured population, enrolled between January 1, 2003, and December 31, 2014, from a large, nationally representative commercial (and Medicare Advantage) claims database. We applied a pre-post with matched control group research design, matching people with bipolar disorder who were enrolled for a year before and after an employer-mandated switch from low-deductible (≤$500) plans to ≥$1000 HDHPs (intervention group) to contemporaneous counterparts in low-deductible plans (control group). Using the 2008–2012 American Community Survey,[4] we classified members as residing in census tracts with below-poverty levels of <10% (hereafter, "higher income") or ≥10% ("lower income"). We also created a 4-level income classification: <5% ("highest income"), 5–9.9% ("high income"), 10–19.9% ("low income"), and ≥20% ("lowest income"). We used coarsened exact matching[5] to balance the groups on employer and member characteristics. Our final sample included 3340 HDHP and 26,466 matched control group members.

Measures included total out-of-pocket spending and 4 mutually exclusive subtypes: inpatient, emergency department, ambulatory, and pharmacy. We calculated annual out-of-pocket spending per member separately during the baseline and follow-up year. At follow-up, we divided inflation-adjusted out-of-pocket spending by the median household income of members' census tract[4] to estimate average proportion of income spent out-of-pocket on health care.

We used zero-inflated negative binomial regression with generalized estimating equations in a difference-in-differences analytic framework to compare pre-to-post changes in out-of-pocket spending between HDHP and control group members. The term of interest was an interaction between study group and study period, and we adjusted for age, gender, poverty level, region, employer size, and index year. We then used marginal effects methods to calculate mean adjusted baseline and follow-up out-of-pocket spending as well as absolute and relative changes. To compare the proportion of income that HDHP members at the 4 income levels spent on medical services, we restricted analyses to the follow-up yearof the HDHP group then applied logistic generalized estimating equation models. Finally, we added the control group to this model and interacted income level and HDHP status to determine if disparities were greater among HDHP versus low-deductible members.

RESULTS

HDHP members with bipolar disorder living in lower-income tracts experienced a 24.6% pre-to-post relative increase in out-of-pocket spending relative to controls (95% confidence interval: 16.5–32.8; absolute: $409.5 [285.8–533.3]; Table 1), and higher-income HDHP members had a corresponding 27.6% (20.8–34.4) increase (absolute: $456.5 [356.7–555.2]). Ambulatory and pharmacy care accounted for most out-of-pocket costs, and these also drove out-of-pocket cost increases in the HDHP cohort (Table 1). At follow-up, the lowest-income HDHP members spent 5.9% (5.6–6.3, Fig. 1) of income on health care whereas the highest-income HDHP members spent 2.3% (2.0–2.6). This disparity was statistically greater than the corresponding disparity among low-deductible members (data not shown).

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Table 1 Out-of-Pocket Spending for Members in the HDHP and Control Groups, Stratified by Income Group

	Out-of-pocket spending, $[1]				Absolute change[1]			Relative change[1]		
	HDHP Group		Control Group		HDHP vs Control,			HDHP vs control,		
	Baseline	Follow-up	Baseline	Follow-up	Follow-up vs baseline, $			Follow-up vs baseline, %		
Lower income[2]										
Total out-of-pocket	1668.7	2072.0	1604.7	1598.6	**409.5**	**(285.8,**	**533.3)**	**24.6%**	**(16.5%,**	**32.8%)**
Total medical	902.2	1259.4	836.3	878.6	**311.6**	**(197.1,**	**426.1)**	**32.9%**	**(19.1%,**	**46.7%)**
ED	49.0	73.6	53.2	68.2	10.8	(−4.8,	26.3)	17.2%	(−10.1%,	44.4%)
Inpatient	103.5	217.1	86.2	147.9	39.4	(−55.5,	134.3)	22.2%	(−38.4%,	82.8%)
Ambulatory	765.2	978.7	698.2	669.4	**245.0**	**(158.6,**	**331.3)**	**33.4%**	**(19.8%,**	**47.0%)**
Total pharmacy	767.8	805.1	767.6	718.5	**86.3**	**(53.0,**	**119.5)**	**12.0%**	**(7.2%,**	**16.8%)**
Higher income[3]										
Total out-of-pocket	1728.6	2108.9	1736.9	1660.9	**456.0**	**(356.7,**	**555.2)**	**27.6%**	**(20.8%,**	**34.4%)**
Total medical	916.5	1224.9	935.0	892.3	**350.3**	**(260.2,**	**440.4)**	**40.1%**	**(27.6%,**	**52.5%)**
ED	42.4	67.0	41.8	43.6	**22.7**	**(6.0,**	**39.4)**	**51.2%**	**(6.1%,**	**96.4%)**
Inpatient	92.7	155.6	80.9	114.8	24.1	(−34.6,	82.8)	18.3%	(−31.6%,	68.2%)
Ambulatory	786.6	1009.2	813.6	740.3	**293.4**	**(222.4,**	**364.4)**	**41.0%**	**(28.9%,**	**53.0%)**
Total pharmacy	815.3	885.7	801.3	767.1	**105.2**	**(74.0,**	**136.5)**	**13.5%**	**(9.3%,**	**17.7%)**

Boldface type indicates a statistically significant estimate with a p value of < 0.05. Estimates for lower-income and higher-income members were derived from separate models
HDHP, high-deductible health plan; ED, emergency department
[1]Estimates derived from zero-inflated negative binomial regression models with generalized estimating equations, adjusted for age category, gender, poverty-level, region, employer size, and index year
[2]Residence in census tract with below-poverty levels of ≥10%
[3]Residence in census tract with below-poverty levels of < 10%

DISCUSSION

Our study is the first to demonstrate that, in a highly vulnerable population, mandated HDHP enrollment is associated with greater out-of-pocket burden and financial inequity than low-deductible health plan enrollment. Results among people with bipolar disorder are likely to generalize to patients with other complex illnesses who require chronic medications and frequent outpatient care. Limitations include using a census tract-based proxy income measure and our inability to assess changes coincident with the HDHP switch such as lower premiums or increased compensation. Our results suggest a need to systematically monitor and report the financial burden of commercial health insurance. Similar to other health plan quality reporting, such information could allow policymakers and payers to assess inequity trends and compare insurers and employers on this crucial measure. In addition, socially conscious employers could, in a cost-neutral manner, enhance equity by cross-subsidizing health insurance resources from high- to low-income workers.[6] Such opportunities include preferentially offering more generous health plans or health savings account contributions to low-wage workers.

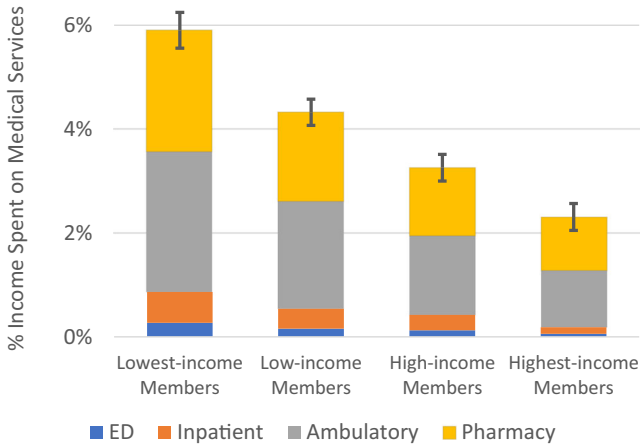

Figure 1 Percentage of income spent on medical services among HDHP members with bipolar disorder during follow-up year, by income level. HDHP, high-deductible health plan; ED, emergency department. Values represent mean percentages of members' out-of-pocket spending divided by the median household income of their 2008–2012 census tract from the American Community Survey, per the 4 income level subgroups (residence in census tract with below-poverty levels <5% ["highest income"], 5–9.9% ["high income"], 10–19.9% ["low income"], and ≥20% ["lowest income"] based on the 2008–2012 American Community Survey). Out-of-pocket spending values were first adjusted for inflation using the medical component of the 2014 consumer price index. Percentages in the plot were derived from generalized estimating equations logistic regression using marginal effects methods. Error bars represent 95% confidence intervals for percentage of income spent on total medical care. Confidence intervals do not overlap among the income categories.

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