Assessing the representativeness of provider encounter data from a large claims database on adults with major depression

Katherine M. Harris, PhD, Chia Chen Teng, MS, Judith J. Stephenson, SM
Carelon Research, Wilmington, DE, USA

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Background

- Major depression is a common and disabling condition. Data from the 2022 National Survey on Drug Use and Health (NSDUH) suggest that 8.3% (21 million) of adults experienced a major depressive episode in the past year and 61.5% received treatment.[1]
- Medical claims data have been commonly used for conducting real-world evidence (RWE) studies about the health and effectiveness of treatment for major depression outside of controlled studies.[2,3]
- Whether results of RWE studies using real-world medical claims are generalizable to people who live in the United States (US) and use treatment for major depression disorder (MDD) is uncertain.
- Medical claims may not represent insured individuals overall and those with MDD due to variation in coverage and associations between MDD and care seeking.

Objectives

- To use data from the NSDUH as benchmarks to assess whether a large, closed claims database is representative of the incidence of major depressive episodes (MDEs) in the past year and receipt of pharmaceutical treatment and/or encounters with healthcare professionals for MDEs among adults with private insurance or Medicare coverage.

Data Sources

- Unweighted survey responses from an annual average of 85,203 privately insured and 14,404 Medicare enrolled adults aged 18 and older obtained from public use files containing cross-sectional data from the 2017-2019 administrations of the NSUDH. The NSUDH uses a national probability sample to generate data on substance use, mental health conditions, and treatment use that is representative of non-institutionalized, US residents aged 12 and older; respondents completed the survey through in-person or web-based interviews.[1]
- Enrollment status, professional and facility claims, outpatient prescription drug use, and health care utilization from the Healthcare Integrated Research Database (HIRD®) for an annual average of 11.4 million privately insured and 1.2 million Medicare enrolled adults aged 18 and older enrolled in Elevance Health plans between 2017-2019.[4] We required study members to be enrolled in a Medicare Advantage or commercial health plan from the last quarter of the prior calendar year to the end of the current year. Race and ethnicity data were obtained from enrollment records, EHR data, third-party sources, and algorithms.[4] Medical claims from healthcare providers and facilities include diagnoses, services received, provider type, billed costs, and site of care. Race and ethnicity data in the HIRD are classified using Office of Management and Budget standards. Recently enrolled individuals were more likely to have documented race and ethnicity data and plan type. HIRD data, including race and ethnicity, are updated monthly.

Approach

- We identified NSDUH respondents reporting an MDE in the past 12 months and the subgroup receiving treatment for depressive feelings from a health care professional or using a prescription medication during this time. We classified provider encounters using NSDUH defined categories: general practitioner, family physician, psychiatrist, other type of medical doctor, psychologist, social worker, or other mental health professional.
- We identified HIRD members who experienced an MDE in the prior calendar year and used treatment for depression in the current calendar year. We defined treatment for depression as having either (1) a any claim with an ICD-10 diagnosis code of major depression or other unspecified depression diagnoses (F32.8, F32.9, or F32.A) or (2) a prescription drug claim for one or more medications for depression. For the numbers as denominators above, members had to be enrolled in a medical plan from the last quarter of the prior calendar year to the end of the current year. For example, members were enrolled from October 1, 2016, to December 21, 2017, for year of 2017. We used CMS National Provider Identifier codes to assign claim-documented providers to NSDUH provider-type categories.
- We conducted a suppression analysis[5] to ensure analytic subgroups from both data sources were large enough to support reliable comparisons based on the following: (1) denominator of 100 or greater; (2) rate greater than 0.00005 or less than 0.99995; (3) relative standard error less than .175; and (4) an effective sample size greater than 68.
- We then compared HIRD-calculated rates to NSDUH benchmarks using standardized mean differences (SMDs). We used commonly employed cut-points[6] shown in the legend below to interpret the magnitude of SMDs.

Results

- Based on the results of our suppression analysis, we collapsed and/or suppressed results for subgroups composed primarily of NSDUH respondents enrolled in Medicare with past year MDEs.
- We found a high degree of similarity (left panel of Table 1) between HIRD-measured incidence of past year MDEs and NSDUH benchmarks, except for privately insured adults aged 18 to 25 (SMD = 0.39). SMDs ranged between 0.02 and 0.17 for privately insured adults older than 26 years and between 0.00 and 0.14 for all Medicare enrolled adults.
- We found differences by source of health insurance in the degree of similarity between HIRD-measured receipt of depression treatment (right panel of Table 1). HIRD-measured treatment rates were less similar to NSUDH benchmarks for adults younger than 50 with private insurance (0.24 ≤ SMD ≤ 0.43) than for those enrolled in Medicare (0.05 ≤ SMD ≤ 0.09).
- Table 2 shows similarity between the HIRD and NSDUH benchmarks in the types of providers treating adults who experienced MDEs in the prior year. Similarities were greatest for insured adults using receiving care from general or family physicians, psychiatrists, social workers (0.04 ≤ SMD ≤ 0.20; and for privately insured adults using prescription medications (SMD = 0.11) and seeing other types of mental health professionals (SMD = 0.17).

Table 1. Comparisons of the percentage of adults with past year MDEs and use of treatment for depression by data source and source of insurance

Characteristics	Percent with a past year MDE						Percent with past year MDEs later treated for depression					
	Privately insured		SMD	Medicare enrolled		SMD	Privately insured		SMD	Medicare enrolled		SMD
	HIRD	NSDUH		HIRD	NSDUH		HIRD	NSDUH		HIRD	NSDUH	
Total	3.5%	6.5%	0.14	5.3%	5.1%	0.01	80.4%	66.6%	0.32	84.4%	83.0%	0.04
Gender												
Male	2.2%	4.1%	0.11	3.6%	3.9%	0.02	76.6%	57.3%	0.42	82.1%	–	–
Female	4.8%	8.1%	0.13	6.5%	6.2%	0.01	82.1%	72.2%	0.24	85.4%	87.1%	0.05
Age category												
18-25	3.7%	14.9%	0.39	15.1%	20.3%	0.14	70.9%	53.8%	0.36	91.0%	–	–
26-49	3.3%	6.9%	0.16	5.1%	4.4%	0.04	79.7%	66.6%	0.30		–	–
50+	3.7%	4.1%	0.02				84.8%	78.5%	0.16	84.2%	81.9%	0.06
Race-ethnicity												
NH White	4.2%	6.9%	0.12	5.6%	5.3%	0.01	82.5%	69.6%	0.31	86.2%	83.0%	0.09
NH Black	2.5%	5.0%	0.13				73.1%	--	--	85.1%	–	–
NH Other	2.3%	5.4%	0.16	4.7%	4.7%	0.00	76.1%	56.4%	0.43			
Hispanic	2.5%	5.9%	0.17				71.8%	56.6%	0.32			

Table 2. Comparisons of sources of depression treatment for insured adults with past year MDEs by data source

Source of care	Privately insured			Medicare enrolled		
	HIRD	NSDUH	SMD	HIRD	NSDUH	SMD
Prescription medication	48.7%	54.3%	0.11	66.8%	44.7%	0.46
General or family physician	36.5%	28.0%	0.18	51.3%	41.6%	0.20
Psychiatrist	21.6%	20.2%	0.04	26.3%	18.4%	0.19
Other, medical doctor	7.3%	20.3%	0.38	11.8%	–	–
Psychologist	18.7%	5.3%	0.42	22.0%	5.4%	0.49
Social worker	5.6%	8.5%	0.11	9.7%	5.7%	0.15
Other, MH professional	5.0%	9.3%	0.17	8.3%	–	–

Legend	Highly similar	0.0 < SMD < 0.2
	Similar	0.2 ≤ SMD < 0.5
	Not reported	Unreliable rate-based application of suppression criteria

Discussion

- Despite substantial methodological differences, we found that HIRD members were similar or highly-similar to national comparator data on the incidence of MDEs and associated use of depression treatment.
- Differences between HIRD-measured MDE and treatment rates and NSDUH benchmarks were smaller for Medicare enrollees and may reflect age-related differences in diagnosis (self-recognized vs. provider rendered) and use of insurance-paid treatment. This suggests that claims-based studies alone may not be representative of the incidence of depression in young adults and of the impact of treatment in this subpopulation.
- Overall, this study contributed to the development of a rigorous and practical empirical framework for further exploration of the representativeness of RWD sources. Such a framework can enhance the confidence in the ability of a large, closed claims database to represent a diverse populations of adults with major depression.

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