

Annual Costs Associated with Patients with Migraine by Intensity of Treatment-Seeking Behavior

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KEY POINTS

- This study used treatment-seeking behavior as a surrogate for disease severity to evaluate all-cause and migraine-related healthcare costs in patients with migraine.
- The main drivers of all-cause total healthcare costs were outpatient services, and in most cohorts, the major driver of migraine care costs was medication.

CONCLUSIONS

- Increased use of migraine-related medical and pharmacy services during the pre-index period generally was associated with elevated annual healthcare expenditures, including all-cause and migraine-related costs, in the post-index period.
- Effective preventive therapies may have potential to reduce treatment-seeking behavior, leading to reduction in direct medical costs.

Background

- Migraine headaches are characterized by pulsating, unilateral, moderate to severe pain lasting 4–72 hours; hypersensitivity to light/sound; and nausea and/or vomiting.¹
 - The severity, frequency, and symptoms of migraine vary among patients and within individuals over time.²
 - Common comorbidities of patients with migraine are insomnia, depression, anxiety, gastric ulcer or gastrointestinal bleeding, peripheral artery disease, angina, allergy, asthma, epilepsy, arthritis, stroke, and vitamin D deficiency.³
- Patients with migraine may receive acute treatments (eg, nonsteroidal anti-inflammatory drugs [NSAIDs], simple analgesics, combination analgesics, triptans), preventive therapies (eg, antiepileptic drugs, beta-blockers), or combinations of these.⁴
- Few previous studies have addressed migraine-associated healthcare resource utilization and costs as a function of treatment-seeking behavior.

Objective

- To evaluate all-cause and migraine-related healthcare costs associated with patients with migraine as a function of the level of treatment-seeking behavior (a surrogate of disease severity)

Methods

- Administrative claims data were analyzed in a retrospective observational study using 2 IBM MarketScan® Research Databases:
 - **MarketScan® Commercial Claims and Encounters Database:** Inpatient (IP), outpatient (OP), and pharmacy data for 147.9 million employees and their dependents under a variety of fee-for-service and managed-care health plans
 - **MarketScan® Medicare Supplemental and Coordination of Benefits Database:** Healthcare data of 10.6 million retirees with Medicare supplemental insurance
- Adult patients with ≥1 migraine medical claim in the pre-index period, with continuous enrollment throughout the entire study period, and without malignancy were eligible (**Figure 1**).
- Patients with migraine were categorized by intensity of migraine-related treatment-seeking behavior in 2016 to examine the relationship with healthcare costs in 2017.
 - “Migraine-related claim” was defined as a claim with a migraine diagnosis on an IP or OP medical claim or migraine-specific treatment.
 - “Migraine-related medication” was defined as prophylactic medication, acute medication, nonspecific acute medication, or any onabotulinumtoxinA (onaBoNT-A; Botox) pharmacy or medical claim.
- Patients were stratified by intensity of treatment-seeking behavior observed in pre-index year, which was based on combinations of utilization of OP and IP services and acute (ARx) and preventive (PRx) prescription migraine medications.
 - OP services consisted of emergency room, physician, OP hospital, and other OP visits.
- The following mutually exclusive patient cohorts were defined:
 - (1) OP services only
 - (2) OP services and ≥1 nonspecific ARx (NSAIDs, opioids)
 - (3) OP services and ≥1 PRx (anti-seizure medications, anti-hypertensive agents, antidepressants) or onaBoNT-A
 - (4) OP services and ≥1 ARx (triptans, ergotamines)
 - (5) OP services and ≥3 ARx and ≥1 PRx or onaBoNT-A
 - (6) OP services and ≥1 PRx or onaBoNT-A and ≥1 nonspecific ARx
 - (7) IP admission only with or without ≥1 ARx, PRx, onaBoNT-A, or nonspecific ARx
 - (8) IP and OP services with or without ARx
- The outcome measures were annual all-cause and migraine-related healthcare utilization and costs during the post-index period.
 - Multivariate regression analyses were performed to control for demographics and baseline clinical characteristics.
 - Generalized linear models with log link function and gamma error distribution were used to evaluate all-cause and migraine-related costs, with only costs >\$0.00 included.

Results

- A total of 338,584 patients met the study criteria (**Figure 2**).
- Approximately 80% of patients were women and approximately half were from a southern geographic region and were covered under a preferred provider organization insurance plan (**Table 1**).
 - Mean patient age was 43.9 years and the average Charlson Comorbidity Index was 0.4.
- The most common comorbidities were non-headache pain, hypertension, and anxiety (**Figure 3**).
- The main drivers of all-cause total healthcare costs (49.6% to 64.1% of total) were OP services (emergency room, office visits, and other services) (**Figure 4**).
- After adjusting for covariates—including pre-index all-cause total healthcare costs—mean all-cause costs across patient cohorts ranged from \$6,620 to \$30,759 per year as healthcare utilization increased (**Figure 5**).
- The percentage of patients with ≥1 claim ranged from 96% to 100% for these cohorts.
- A major driver of migraine-related total healthcare costs was migraine-related pharmacy costs for the majority of patient cohorts (**Figure 6**).
 - Migraine-related OP costs were the main drivers (64.4%–80.4%) in cohorts (1) and (2).
 - Migraine-related pharmacy costs were the main drivers (42.2%–64.8%) in cohorts (3) to (8).
- Regression analyses confirmed that increasing utilization of migraine-related medication increased total costs among migraine patients with OP services (**Figure 7**).
 - Patients with migraine-related IP admission had higher healthcare costs (total, IP, OP, or pharmacy costs) than did those with only OP services and had the highest costs with both migraine-related IP and OP services.

Study Limitations

- The current study is subject to the limitations of administrative claims data, which include generalizability, complexity, coverage and benefit restrictions, lack of coverage continuity, and potential for data errors.
 - In addition, this study focused on how migraine severity translates to medical costs and did not address how migraine affects other aspects of patients’ lives, including productivity, quality of life, and social functioning.
- Systematic differences may exist among the study cohorts and could account for the differences seen in healthcare costs and utilization.

Figure 1. Study Period Design

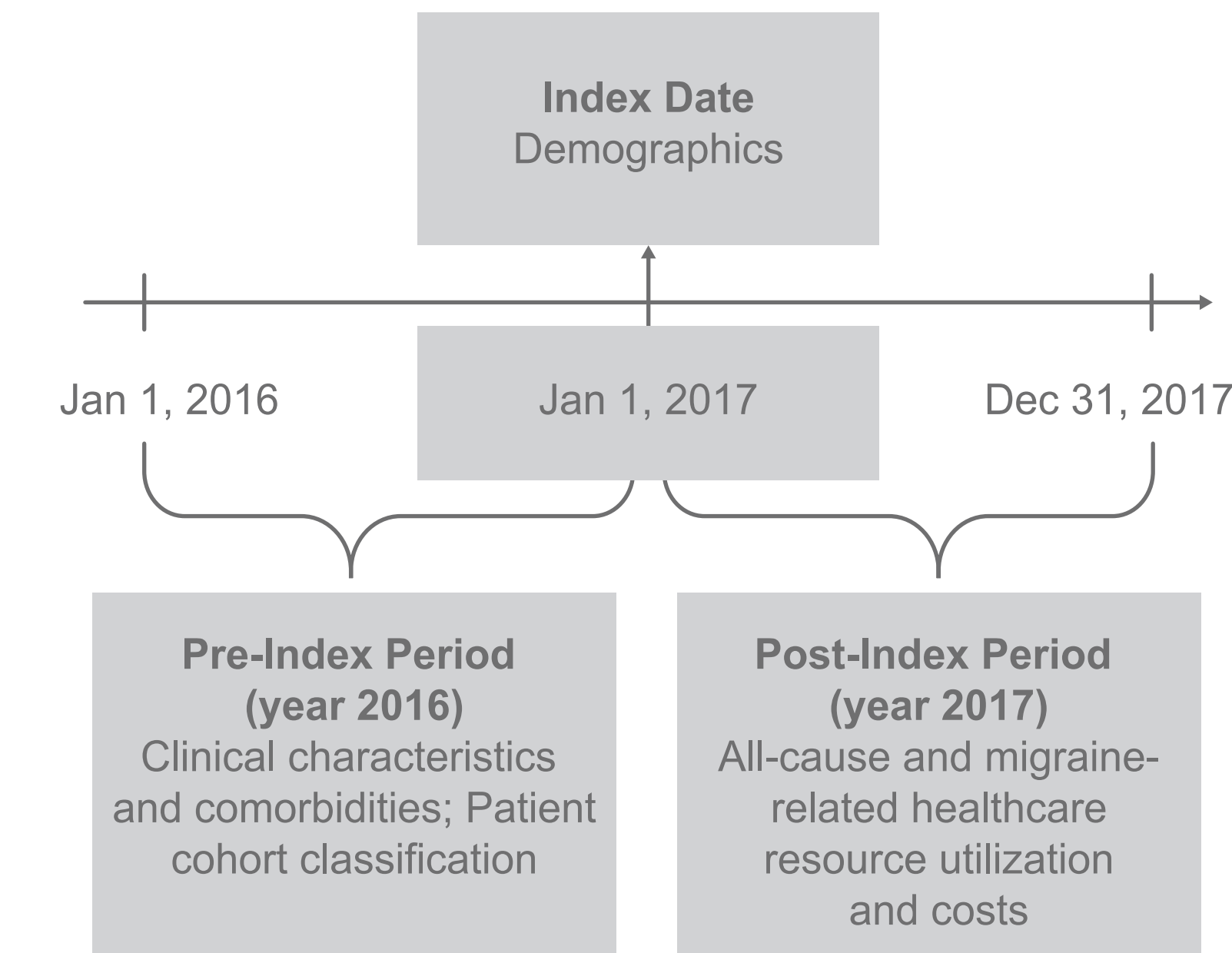
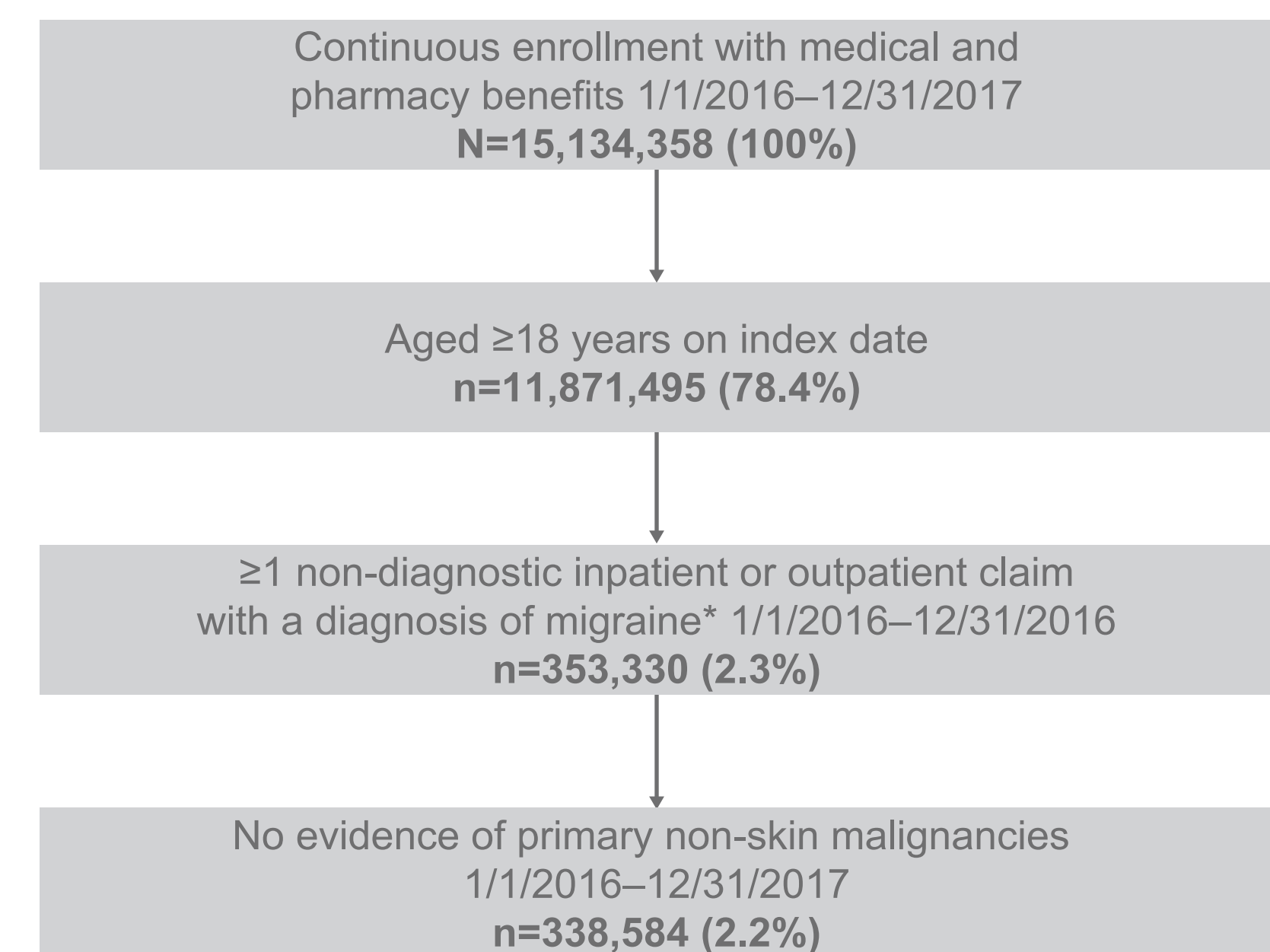


Figure 2. Inclusion Cascade

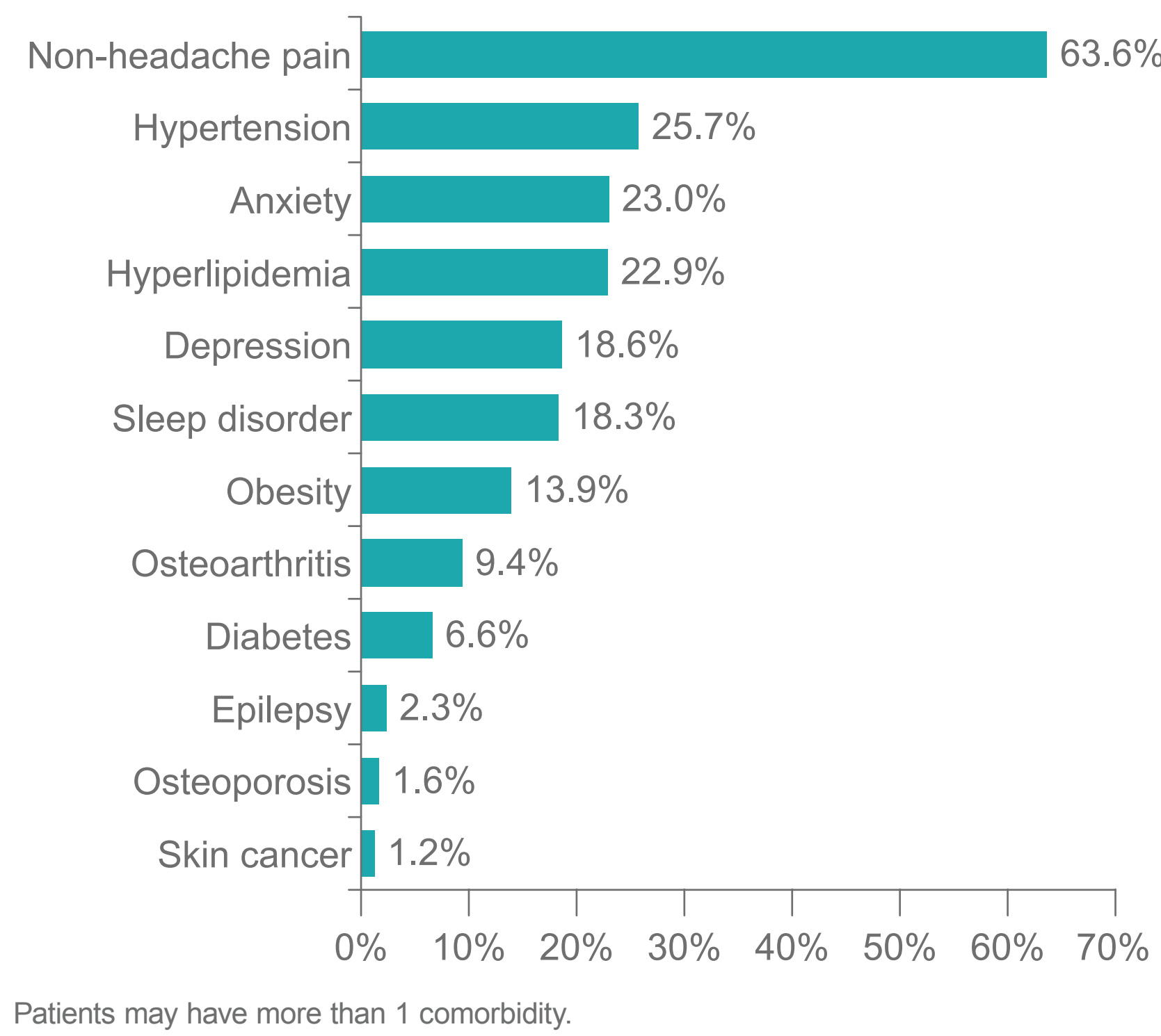


*The medical claim of migraine diagnosis was required to be a non-rule out (non-diagnostic) claim, meaning it was a confirmed diagnosis by their healthcare providers.

Table 1. Demographic and Clinical Data Captured on the Index Date

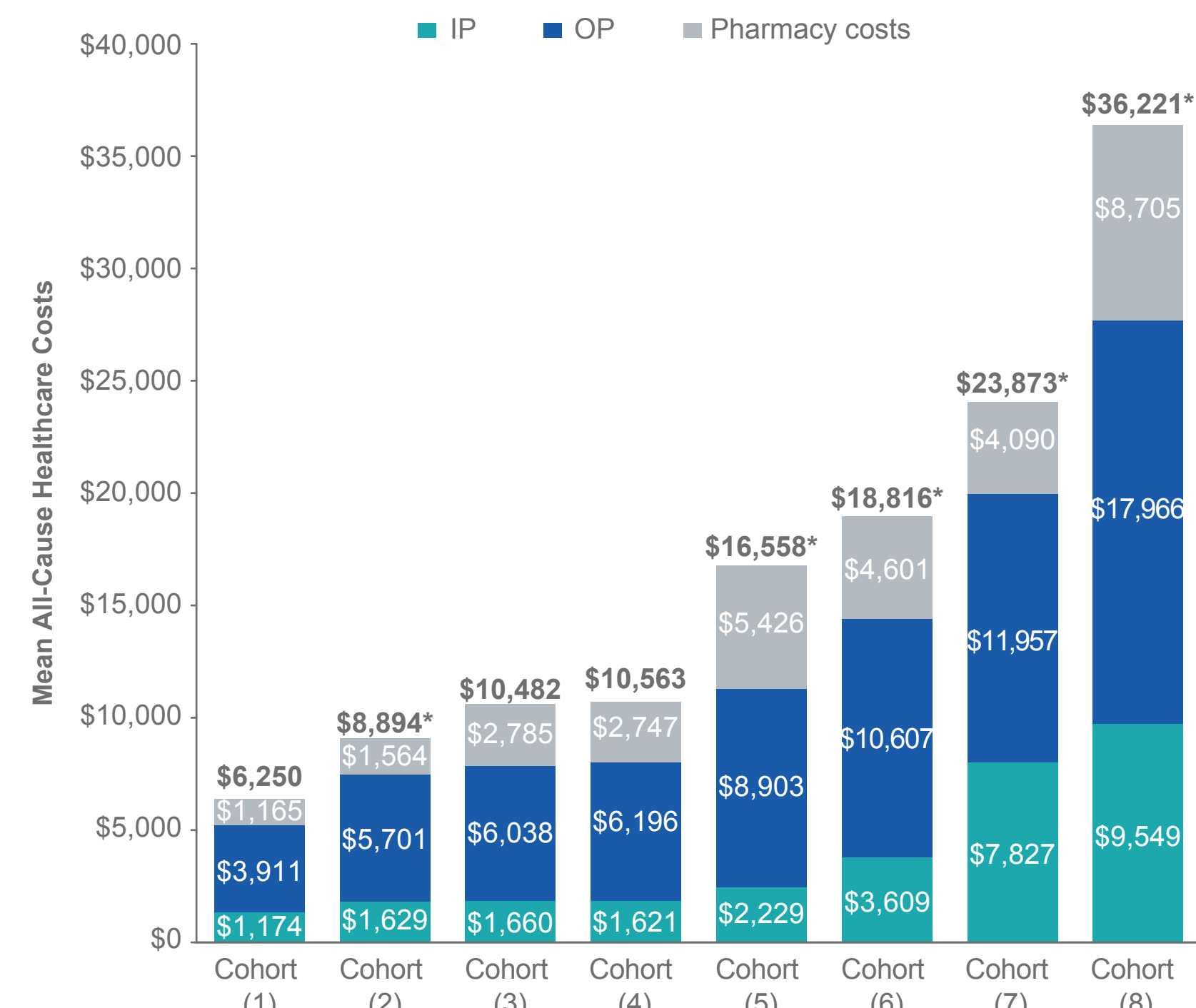
	Patients, n (%)
Total population	338,584
Number of men:women	62,131:276,453 (18.4:81.6)
Age range, years	
18–24	38,130 (11.3)
25–34	47,547 (14.0)
35–44	82,344 (24.3)
45–54	92,242 (27.2)
55–64	64,428 (19.0)
65–74	9,820 (2.9)
75+	4,073 (1.2)
Geographic region	
Northeast	55,662 (16.4)
North Central	73,714 (21.8)
South	159,678 (47.2)
West	48,940 (14.5)
Unknown	590 (0.2)
Insurance plan type	
Comprehensive	16,216 (4.8)
Exclusive Provider Organization	2,966 (0.9)
Health Maintenance Organization	39,317 (11.6)
Point of Service	24,550 (7.3)
Preferred Provider Organization	176,024 (52.0)
Point of Service with Capitation	3,262 (1.0)
Consumer-Directed Health Plan	43,496 (12.8)
High-Deductible Health Plan	27,059 (8.0)
Unknown	5,694 (1.7)
Payer	
Commercial	324,222 (95.8)
Medicare	14,362 (4.2)

Figure 3. Comorbidities During the Pre-Index Period



Patients may have more than 1 comorbidity.

Figure 4. All-Cause Annual Healthcare Costs in the Post-Index Period (Unadjusted)



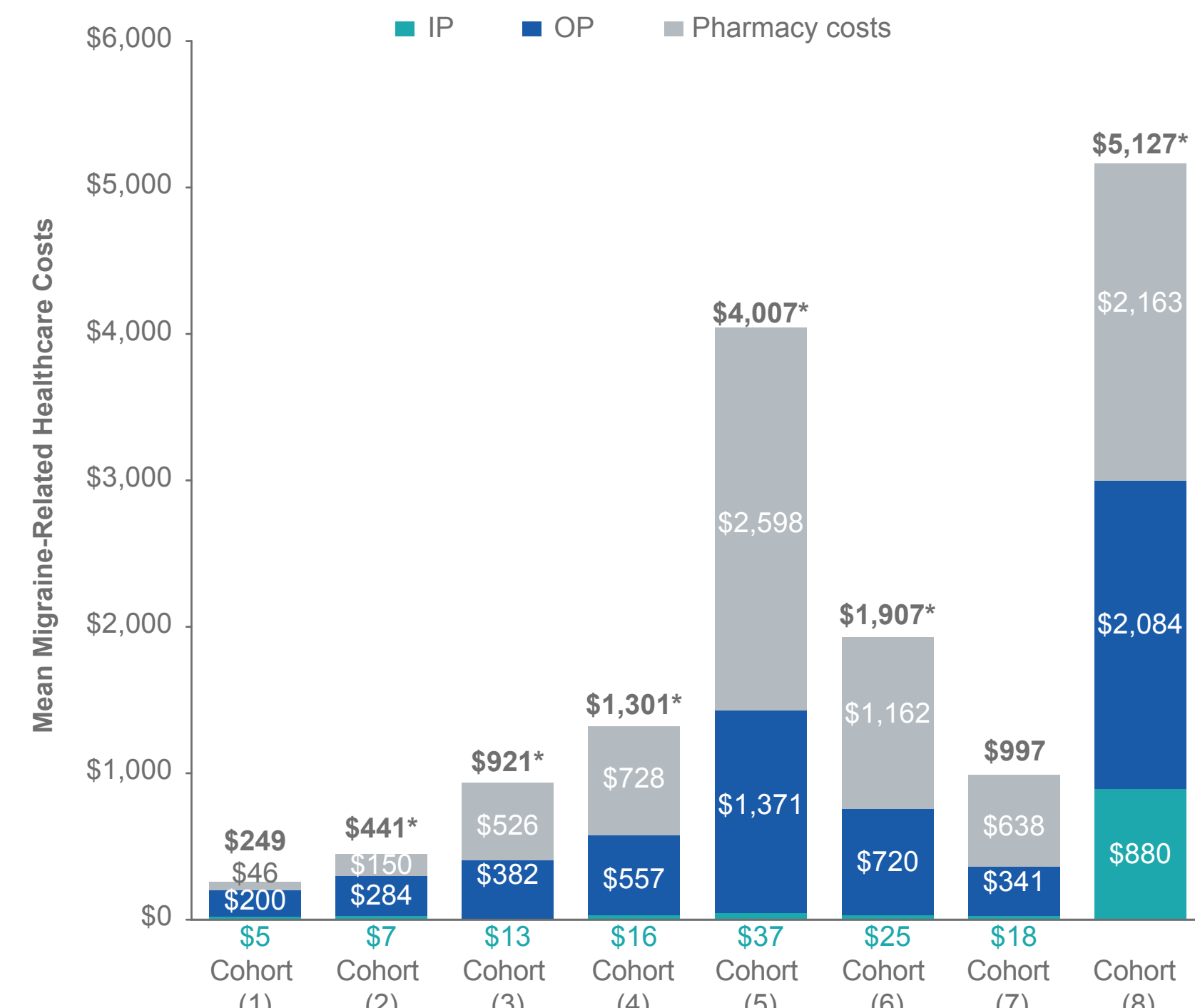
*There was a significant difference between the patient cohort and the prior patient cohort ($P<0.001$). IP, inpatient; OP, outpatient.

Figure 5. All-Cause Annual Healthcare Costs in the Post-Index Period (Adjusted)



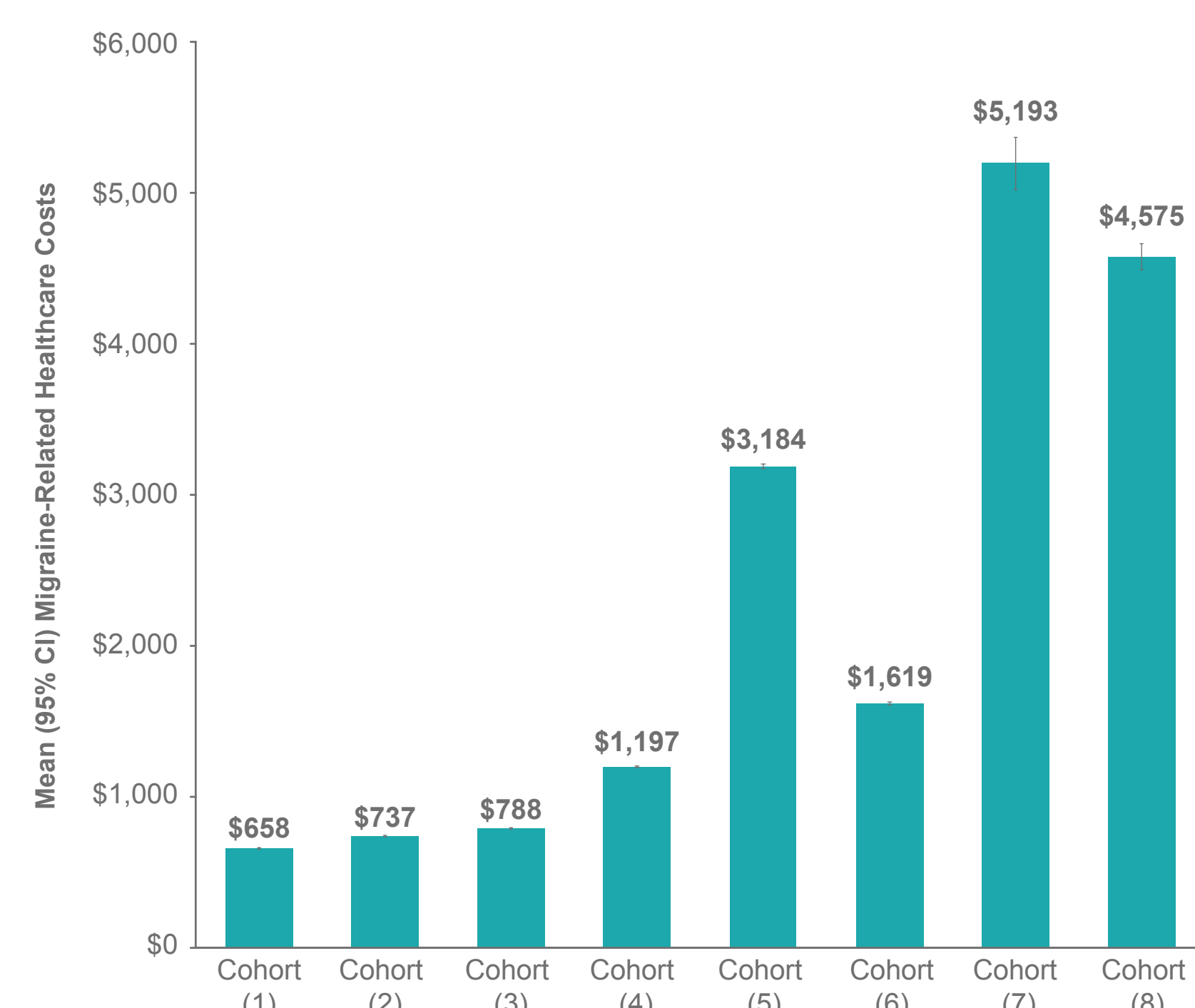
Adjusted for the following covariates: cohort group, age, gender, regionality, plan type, Charlson Comorbidity Index, and pre-index all-cause total healthcare costs. CI, confidence interval.

Figure 6. Migraine-Related Healthcare Costs in the Post-Index Period (Unadjusted)



*There was a significant difference between the patient cohort and the prior patient cohort ($P<0.001$). IP, inpatient; OP, outpatient.

Figure 7. Migraine-Related Healthcare Costs in the Post-Index Period (Adjusted)



Adjusted for the following covariates: cohort group, age, gender, regionality, plan type, Charlson Comorbidity Index, and pre-index migraine-related total healthcare costs. CI, confidence interval.

References

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Disclosures

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