

Milliman Behavioral Health Advisor

Opioid use disorder: Costs, utilization, and comorbidities

What needs to be considered?

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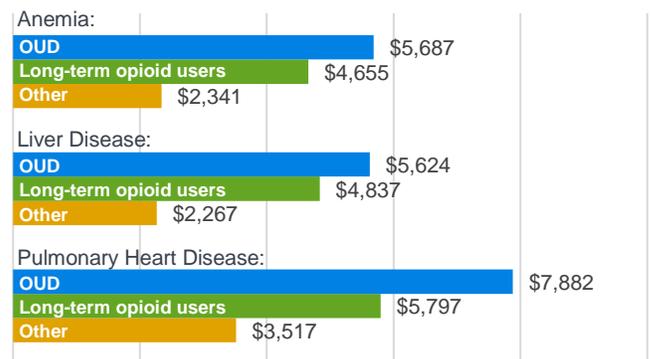
Cost and comorbidities of opioid use disorder

EXCESS HEALTHCARE COSTS OF OUD

In a recently published white paper,¹ Milliman found that opioid use disorder (OUD) may have added \$10.8 billion to the cost of treating commercially insured patients across the United States in 2016. Many patients with OUD have complex healthcare needs, contributing to their significant healthcare costs. We explored the economic impact of OUD² in patients with at least one of 25 chronic medical conditions and found these health complexities to be prevalent. The studied comorbidities were found in nearly 60% of patients with OUD in 2016 and in 85% of patients without OUD who exhibited elevated opioid usage (coined “long-term opioid users”³ in this report, or “opioid super-users” in the published white paper).

Excess costs for individuals with OUD and comorbid chronic medical conditions represent a significant value opportunity for potential reductions through targeted treatment strategies. Figure 1 highlights the per member per month (PMPM) cost differences in 2016 for three of the studied chronic medical conditions across three commercially insured population cohorts: individuals with OUD, long-term opioid users, and all others (individuals without OUD and those with a proportion of days covered [PDC] for opioids of less than 75% in 2016).

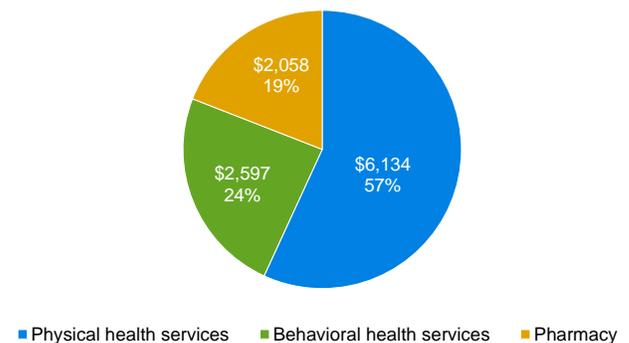
FIGURE 1: AVERAGE PMPM HEALTHCARE COSTS PER PATIENT WITH SELECT CHRONIC MEDICAL CONDITIONS BY OPIOID USE COHORT, 2016



COST DIFFERENCES BY TYPE OF SERVICE

Previous Milliman studies have found that most of the excess healthcare costs for patients with behavioral and chronic medical comorbidities result from increased medical treatment, rather than directly from higher utilization of behavioral services.^{4,5} This analysis found a similar result for patients with OUD: over half of the excess costs for these comorbid patients were spent on physical healthcare services. Figure 2 shows a breakdown of the \$10.8 billion of excess costs in 2016 for individuals with OUD by broad healthcare service category.

FIGURE 2: TOTAL EXCESS ALLOWED COST (IN MILLIONS) FOR PATIENTS WITH OUD BY BROAD SERVICE CATEGORY, 2016



Although the OUD and long-term opioid user populations make up only 1.5% of the total population, they account for over 80% of the total opioid spend among the commercially insured population in the United States. The remaining 98.5% of the population accounts for only 20% of prescription opioid expenditures. Figure 3 shows the comparison of the proportion of opioid spend for each opioid use cohort alongside the percentage of the population that each cohort represents.

FIGURE 3: COMPARISON OF PRESCRIPTION OPIOID SPEND AND POPULATION SIZE BY COHORT, 2016

| cohort | percent of opioid spend | percent of population |
|------------------------|-------------------------|-----------------------|
| OUD | 17.4% | 0.3% |
| Long-Term Opioid Users | 62.9% | 1.2% |
| Other | 19.6% | 98.5% |

COMPARING OUD TO NON-OUD PATIENT COSTS

If the same population is divided into those diagnosed with OUD and those not diagnosed (as identified through diagnosis codes related to opioid abuse, dependence, or poisoning, without regard to prescription drug histories), then disparities between the allowed PMPM claim costs of these populations can be observed. By service category, behavioral inpatient and outpatient facility categories show cost relativities, defined as the ratio between the average allowed PMPM costs for the OUD and non-OUD diagnosed populations, of 61.2 and 123.2, respectively. This indicates that, for behavioral inpatient services, the OUD population's average allowed costs were 61.2 times that of the non-OUD population's costs. This is expected, due to the increased use of substance use treatment facilities in the OUD-diagnosed population. However, inpatient and outpatient facility services used to treat physical health also showed cost relativities of 5.8 and 3.2, respectively, indicating OUD claim costs are three to six times higher than those of the non-OUD population.

Emergency room (ER) cost relativities between the OUD and non-OUD populations were also notable, at 5.6. These relativities were even greater for younger patients aged 25 and under, at 12.6 for physical inpatient, 4.6 for physical outpatient facility, and 9.3 for ER. Figure 4 shows these relativities by service category for a 2016 commercial population.

FIGURE 4: ALLOWED COST PMPM RELATIVITIES FOR OUD VS. NON-OUD PATIENTS BY SERVICE CATEGORY, 2016

| Service Category | Allowed Cost PMPM Relativity |
|----------------------------------|------------------------------|
| Inpatient – Physical | 5.8 |
| Inpatient – Behavioral | 61.2 |
| Outpatient Facility – Physical | 3.2 |
| Outpatient Facility – Behavioral | 123.2 |
| Emergency Room | 5.6 |

Utilization disparities for opioid use disorder

Behavioral inpatient and outpatient facility categories showed similar disparities in utilization per 1,000 to those observed for allowed cost PMPMs. Utilization per 1,000 relativities between the OUD and non-OUD diagnosed populations were 64.2 and 78.4, respectively, where utilization is measured in admits for inpatient services and cases for outpatient facility services. Physical inpatient and outpatient facility also showed utilizations per 1,000 relativities of 4.0 and 2.0, respectively, indicating OUD utilization of these services at two to four times the rate of the non-OUD population.

Not only did the OUD population utilize more inpatient services than the non-OUD population, but their lengths of stays were longer. Comparing inpatient days for OUD patients to non-OUD patients showed a utilization per 1,000 relativity of 4.1 and 70.3 for physical and behavioral health services, respectively.

Emergency room services also showed higher relativities between the OUD and non-OUD diagnosed populations, at 4.1. Similar to claim cost relativities, these relativities were observed to be greater for members with ages under 25, at 10.8 for physical inpatient (as measured by days), 2.5 for physical outpatient facility, and 5.9 for ER. Figure 5 shows these relativities by service category for a 2016 commercial population.

FIGURE 5: UTILIZATION PER 1,000 RELATIVITIES FOR OUD VS. NON-OUD PATIENTS BY SERVICE CATEGORY, 2016

| Service Category | Units | Utilization per 1,000 Relativity |
|----------------------------------|--------------|----------------------------------|
| Inpatient – Physical | Admits | 4.0 |
| Inpatient – Behavioral | Admits | 64.2 |
| Inpatient – Physical | Days | 4.1 |
| Inpatient – Behavioral | Days | 70.3 |
| Outpatient Facility – Physical | Cases/Admits | 2.0 |
| Outpatient Facility – Behavioral | Cases/Admits | 78.4 |
| Emergency Room | Cases/Admits | 4.1 |

Looking ahead

Due to the complexity of health status for patients with OUD and elevated opioid use, there is no simple treatment solution that works for all patients. These analyses aim to highlight the importance of providing comprehensive support for the complex healthcare needs of these patients, including effective management of chronic pain and other medical conditions, in addition to support for patients recovering from substance use disorders. As such, payers and at-risk providers may find that

investments in enhanced care, including options such as medication-assisted treatment, behavioral healthcare integration, and effective chronic pain management may present an opportunity to address and potentially reduce healthcare costs for patients suffering from both OUD and comorbid chronic medical conditions.

Data sources and methodology

This analysis is based on three large national research databases:

- 2016 Truven MarketScan Commercial Claims and Encounters Database®
- 2016 Milliman Consolidated Health Cost Guidelines™ Database

The Truven MarketScan research database reflects the healthcare experience of employees and dependents covered by the health benefit programs of large employers, health plans, and government organizations. These claims data are collected from approximately 350 payers. The MarketScan Commercial Claims and Encounters Database includes data from active employees, early retirees, COBRA continuees, and dependents insured by employer-sponsored plans.

The Milliman Consolidated Health Cost Guidelines Database contains healthcare experience primarily for large group commercial members, using data contributed from a number of payers with which Milliman has data purchase or trade agreements. Milliman collects this data from various health plans for use in product development, research, and client projects.

Broad service categories were mapped to the data using proprietary mapping logic, which utilizes a combination procedural and revenue codes.

Caveats and limitations

The results in this analysis reflect commercial large group employer-sponsored insurance and thus likely under-represent lower-income households that purchased individual coverage under the Patient Protection and Affordable Care Act (ACA). Additionally, while sampling errors are quite small due to the large sample sizes available in each data set used for this analysis, sampling bias could be present to the extent that health plans and payers that contribute to the research databases differ systematically from non-contributors.

The diagnosis codes used to identify opioid use disorder include a range of severities, with some cases of uncomplicated use and some remission. Additionally, opioid overdose does not always happen within the context of an opioid use disorder, especially in

the elderly or opioid-naïve. Due to lack of available data, we were not able to analyze chronic condition comorbidities for individuals who obtain opioids outside of a prescription. Additionally, there are likely patients with opioid use disorder who are not represented in the OUD population in this study who have prescription drug claims for opioid treatment therapies that do not have corresponding medical claims associated with an opioid use disorder diagnosis. These patients may be currently represented in the non-OUD population.

These analyses are intended to highlight the impact of opioid use disorder on chronic medical conditions in the United States and present overall costs and utilization of healthcare services for those diagnosed with opioid use disorder in the United States compared to those never diagnosed with opioid use disorder, as identified through diagnosis codes related to opioid abuse, dependence, or poisoning, without regard to prescription drug histories. Opioid therapy is a complicated medical practice, and we do not suggest or endorse any particular opioid prescribing strategy.

Milliman has not audited the research data set used for this analysis, but we have extensive experience working with this data and have found it to be reasonable. To the extent that there are errors or omissions in any of the data sources relied upon for this analysis, these results may also be in error. This report does not represent conclusive recommendations regarding treatment of opioid use disorder or legal advice. Milliman does not intend to benefit or create a legal duty to any recipient of this work.

Additionally, this report explores the healthcare costs for people with both chronic medical conditions and various degrees of opioid use. Our analysis does not include a study of the causality of cooccurring medical and behavioral conditions, nor does it involve a detailed risk assessment of each patient.

Our national projections extrapolate the results from our database analyses to national population estimates for the commercially insured population cohort. To the extent that the national population healthcare costs and risk levels for any of these cohorts differ from that represented in the databases that we used, our national estimates may need adjustment. The databases we used represent the best available sources for our analysis.

The information in this study is designed to describe the prevalence and healthcare costs of insured members with certain chronic medical conditions, behavioral conditions, or both. It may not be appropriate and should not be used for other purposes.

Milliman did not receive any external funding for this analysis. Any opinions or views expressed in this report are those of the authors, not of Milliman.

ENDNOTES

- 1 Davenport, S., Weaver, A., & Caverly, M. (March 4, 2019). Costs and Comorbidities of Opioid Use Disorder. Milliman White Paper. Retrieved April 11, 2019, from <http://www.milliman.com/insight/2019/Costs-and-comorbidities-of-opioid-use-disorder/>.
- 2 Opioid use disorder was identified in the data using diagnosis codes for opioid abuse, dependence, or poisoning. This includes ICD-9-CM codes beginning with 304.0, 304.7, 305.5, and 965.0, and ICD-10-CM codes beginning with F11, T40.0, T40.1, T40.2, and T40.3.
- 3 In this analysis, we defined long-term opioid users as individuals without diagnosed OUD who were covered by an opioid prescription for at least three-quarters of 2016 (measured as having a proportion of days covered, or PDC, of at least 75% for prescription opioids). PDC is a common medication adherence measure, calculated as the number of days in a period for which a person has a drug supply divided by the total number of days in a period for which the person is eligible for prescription drug coverage.
- 4 Melek, S., Norris, D., et al. (January 2018). Potential Economic Impact of Integrated Medical-Behavioral Healthcare: Updated Projections for 2017. Milliman Research Report. Retrieved February 14, 2019, from <http://www.milliman.com/uploadedFiles/insight/2018/Potential-Economic-Impact-Integrated-Healthcare.pdf>.
- 5 Melek, Stephen P, et al. (April 2014). Economic Impact of Integrated Medical-Behavioral Healthcare. Milliman American Psychiatric Association Report. Retrieved January 30, 2018, from <https://www.psychiatry.org/File%20Library/Psychiatrists/Practice/Professional-Topics/Integrated-Care/Milliman-Report-Economic-Impact-Integrated-Implications-Psychiatry.pdf>.



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