

# Prevalence of Opioid Abuse and Related Costs in a Commercial Managed Care Population

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## BACKGROUND

Opioids are an important component of pain management, and the increased use of prescription opioids has been accompanied by a dramatic rise in the rate of opioid drug abuse.<sup>1,2</sup> Resource utilization and costs due to opioid abuse are significant from a managed care payer point of view but have not been documented extensively.<sup>3</sup> Understanding comorbidities, as well as healthcare resource use and costs of individuals diagnosed with opioid abuse relative to a control group, can provide insight in identifying potential candidates for screening and prevention.

## OBJECTIVE

To measure the prevalence and resource use/cost burden of diagnosed opioid abuse in Humana commercial members.

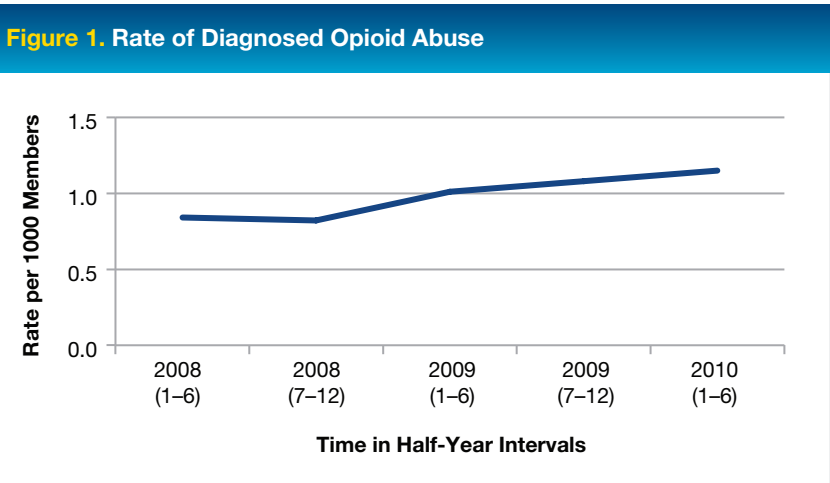
## METHODS

- This study was a retrospective analysis of claims data for Humana commercial members during the study period January 1, 2007 to June 30, 2011.
- Overall prevalence of opioid abuse was assessed using the following International Classification of Disease Ninth Revision Clinical Modification (ICD-9-CM) codes:
  - 304.0x: opioid type dependence
  - 304.7x: combination of opioid abuse with any other
  - 305.5x: opioid abuse
  - 965.0x: poisoning by opiates and related narcotics (excluding 965.01: poisoning by heroin).
- Incremental resource use and cost of opioid abuse was assessed by identifying members with an ICD-9-CM claim for abuse (cases) between January 1, 2008 and June 30, 2010 and matching 1:2 with members with no claims for abuse (controls), among all members with a prescription fill for an opioid. Matching was based on geographic region, enrollment period, age, and gender.
- Initial diagnosis of opioid abuse was defined as the index date. Resource use, comorbidities, and costs were examined 12 months pre- and postindex date.
- Exclusion criteria were:
  - Administrative Services Only employer groups excluded from research by contract,
  - Pregnancy (630.xx – 679.xx, V22.xx, V23.xx),
  - Skilled nursing facility stay,

- Opioid abuse diagnosis in the preindex period; or
- Members not continuously enrolled for 12 months pre- and postindex.
- A multivariate analysis was conducted using generalized linear modeling with log-transformed abuse-related costs as the dependent variable.

## RESULTS

- The 6-month prevalence (per 1000 members of diagnosed opioid abuse increased from 0.84 in the first half of 2008 to 1.15 in the first half of 2010 (**Figure 1**). During this same time period, the prevalence of opioid use decreased slightly from 118 .0 to 114.8 per 1000 members.



- Cases were similar to matched controls in terms of age, gender distribution, and geographic region (**Table 1**).
- Compared with controls, members diagnosed with opioid abuse had a significantly higher mean RxRisk-V score and filled more prescriptions for opioids and for total pain medications during the preindex period (**Table 1**). The RxRisk-V is a comorbidity index derived from drug claims data and has been validated to predict health care utilization and cost.<sup>4,5</sup>
- Members diagnosed with opioid abuse also reported significantly higher rates of substance abuse, psychiatric diagnoses, and hepatitis A, B, or C in the preindex period than nonabuse controls (**Table 1**).
- In the postindex period, total abuse-related costs were \$2099 higher, whereas all-cause direct costs were \$19,933 higher for members diagnosed with opioid abuse relative to those not diagnosed with opioid abuse (**Table 2**).

| Table 1. Demographic and Clinical Characteristics of Members Diagnosed with Opioid Abuse Cases and Matched Controls During Preindex |                    |                  |           |
|---|--------------------|------------------|-----------|
|   | Opioid Abuse Cases | Matched Controls | P Value   |
| Age, mean (SD)  | 40.4 (12.9)        | 40.5 (12.93)     | NS        |
| Gender, female (%)  | 46.0               | 46.0             | NS        |
| Geographic region, South (%)  | 63.3               | 63.3             | NS        |
| Mean RxRisk-V score, mean (SD)  | 5.2 (3.0)          | 3.2 (2.2)        | P < 0.001 |
| No. of opioid prescriptions, mean (SD)  | 13.9 (12.2)        | 2.4 (3.6)        | P < 0.001 |
| No. of pain medication prescriptions, mean (SD)   | 25.5 (21.1)        | 5.5 (7.9)        | P < 0.001 |
| Substance abuse diagnosis, %  | 38.8               | 8.4              | P < 0.001 |
| Psychiatric diagnosis, %  | 59.1               | 16.9             | P < 0.001 |
| Hepatitis A, B, or C diagnosis, %   | 2.9                | 0.3              | P < 0.001 |
| NS, not significantly different at 5% level.  |                    |                  |           |

| Table 2. Incremental Costs of Opioid Abuse Cases Relative to Controls |                           |                         |                                 |                           |
|---|---------------------------|-------------------------|---------------------------------|---------------------------|
| Type of Cost  | Opioid Abuse Cases        | Matched Controls        | Two-Sample t-Test               | Incremental Cost of Abuse |
| Abuse-Related Costs   |                           | Mean (Median)           |                                 | Difference in Means       |
| Physician's visit/outpatient  | \$683.12 (\$1790.22)      | \$0.04 (\$1.74)         | t df (920) = 11.6<br>P < .0001  | \$683.08                  |
| Inpatient   | \$1325.37 (\$5441.51)     | \$0.00 (\$0.00)         | t df (920) = 7.4<br>P < .0001   | \$1325.37                 |
| Emergency department visits   | \$90.86 (\$635.99)        | \$0.00 (\$0.00)         | t df (920) = 4.3<br>P < .0001   | \$90.86                   |
| Total abuse-related costs   | \$2099.35 (\$6156.41)     | \$0.04 (\$1.74)         | t df (920) = 10.3<br>P < .0001  | \$2099.31                 |
| All Other Costs   |                           |                         |                                 |                           |
| Physician's visit/outpatient  | \$7406.83 (\$18,821.39)   | \$2854.88 (\$9769.48)   | t df (1174) = 6.9<br>P < .0001  | \$4551.95                 |
| Inpatient   | \$9174.34 (\$29,776.67)   | \$1150.14 (\$12,526.09) | t df (1086) = 7.8<br>P < .0001  | \$8024.20                 |
| Emergency department visits   | \$2147.24 (\$6646.01)     | \$357.47 (\$1336.33)    | t df (957) = 8.1<br>P < .0001   | \$1789.76                 |
| Prescription drugs  | \$4641.19 (\$5822.61)     | \$1173.04 (\$3150.59)   | t df (1196) = 16.9<br>P < .0001 | \$3468.15                 |
| Total all other direct costs  | \$23,369.59 (\$41,647.92) | \$5535.53 (\$17,484.99) | t df (1085) = 12.5<br>P < .0001 | \$17,834.06               |
| Total Abuse-Related and All Other Direct Costs                        | \$25,468.94 (\$41,973.69) | \$5535.57 (\$17,484.99) | t df (1083) = 13.8<br>P < .0001 | \$19,933.36               |

- In the multivariate model, adjusted costs were 13% higher for members diagnosed with opioid abuse than for controls, 25% higher for members with abuse-related comorbidities, 7% higher for members with pain-related comorbidities relative to those without such comorbidities, and 12% higher per unit increase in RxRisk-V score (**Table 3**).

| Table 3. Generalized Linear Model Results for Adjusted Costs |                    |                |         |                                  |
|--|--------------------|----------------|---------|----------------------------------|
|  | Parameter Estimate | Standard Error | P Value | Parameter Estimate Exponentiated |
| Age  | −0.0035            | 0.00           | 0.43    | 1.00                             |
| Age squared  | 0.0000             | 0.0000         | 0.34    | 1.00                             |
| RxRiskV score  | 0.11               | 0.00           | < .0001 | 1.12                             |
| Gender (female = 1)  | −0.11              | 0.01           | < .0001 | 0.90                             |
| Region (reference = 3–South)                                 |                    |                |         |                                  |
| Region 1 – Northeast   | 0.24               | 0.09           | < .01   | 1.27                             |
| Region 2 – Midwest   | 0.28               | 0.03           | < .0001 | 1.32                             |
| Region 4 – West  | 0.02               | 0.02           | 0.25    | 1.02                             |
| Abuse-related comorbidities                                  | 0.22               | 0.02           | < .0001 | 1.25                             |
| Nonpain-related comorbidities                                | −0.07              | 0.05           | 0.11    | 0.93                             |
| Pain-related comorbidities                                   | 0.07               | 0.02           | < .005  | 1.07                             |
| Abuser (abuser = 1)  | 0.12               | 0.02           | < .0001 | 1.13                             |

## DISCUSSION

- Our finding that higher costs are associated with high rates of pain-related comorbidities, substance abuse, and psychiatric diagnoses among members prescribed an opioid is consistent with previous studies (**Table 3**).<sup>6,7</sup>
- This study indicates many of the differences in comorbidity prevalence between members with and without an opioid abuse diagnosis existed prior to the index date, suggesting long-term chronicity of these conditions. Closer examination of the onset and severity of pain-related and psychiatric conditions, especially if prior to the diagnosis of opioid abuse, would provide valuable insight into potential mediators of opioid abuse.
- Preabuse clinical characteristics and utilization patterns may provide relevant information that could help providers assess their patients' risks in developing opioid abuse. This could be done through the development of a practice-based tool, assessing the risk of opioid abuse among candidates for opioid therapy.

## LIMITATIONS

- Limitations common to studies using administrative claims data apply to this study, including:
  - Use of medical claims to identify opioid abuse, as documented diagnoses identify only a subset of all opioid abusers.
  - Some individuals with prescription fills for opioids may engage in diversion practices, which cannot be ascertained by examining claims alone.
  - Lack of certain information in the database (eg, lab results, weight, and health behavior information) and errors in claims coding (misclassification bias).
  - Although multivariate regression modeling was used to reduce selection bias and strengthen the causal inference, it can only reduce bias caused by measured covariates. It cannot reduce bias caused by unmeasured covariates.
  - Because this study used data related to only one health plan, the results may not be generalized to the general population in the United States; however, members of this health plan reside in many geographic regions in the country.

## CONCLUSIONS

- Members diagnosed with opioid abuse in the Humana commercial population experienced significantly higher health care-related costs than a control population without the diagnosis of opioid abuse. To our knowledge, this study provides the first published estimates of diagnosed opioid abuse and its cost burden in the Humana commercial membership.

## REFERENCES

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Disclosures

- This research project was funded jointly by Humana Inc. and Pfizer Inc.
- Margaret Pasquale, Robert Dufour, and Nick Patel are employees of Competitive Health Analytics, a wholly owned subsidiary of Humana Inc., who were paid consultants to Pfizer. George Andrews is an employee of Humana Inc. David Schaaf and Jack Mardekian are employees and stockholders of Pfizer Inc. Ashish Joshi was an employee of Pfizer Inc at the time of this study and is a stockholder of Pfizer Inc.

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