

# COMPARISONS OF EMPLOYEE WORKERS' COMPENSATION COSTS AND ABSENCE DAYS USING A NATIONAL DATABASE

Richard A. Brook, MS, MBA<sup>1</sup>; Nathan L. Kleinman, PhD<sup>2</sup>; Arthur K. Melkonian, MD<sup>3</sup>; James E. Smeeding, RPh, MBA<sup>4</sup>

<sup>1</sup>Head, Retrospective Analysis, The JeSTARx Group, Newfoundland, NJ; <sup>2</sup>Director, Research Services, HCMS Group, Paso Robles, CA;

<sup>3</sup>Senior Research Analyst, HCMS Group, Cheyenne, WY; <sup>4</sup>President, The JeSTARx Group, Dallas, Tx

**OBJECTIVES:** To compare the incremental costs and absences due to workers' compensation (WC) among employees with bipolar disorder (BPD), other mental disorders (OMD), chronic constipation (CC), functional dyspepsia (FD), gastroesophageal reflux disease (GERD), gout, Hepatitis-C (HCV), and insomnia.

**METHODS:** Subjects with the study conditions and controls (employees without the condition) were identified in a 2001-2007 US Employee Database. All studies used two-part regression models to control for differences between employees and controls. WC costs included salary replacement payments made to the employee and associated medical payments (adjusted to 2007 US\$). Absences were based on days missed during the WC claim. Index dates were the date of the employees' first diagnosis (by condition). Controls (by study) used the average index date of subjects with the condition. Incremental costs and absences were defined as adjusted differences between the condition cohort and controls and considered significant at  $P \leq 0.05$ .

**RESULTS:** Employees with WC eligibility varied from 339 to 17,714 in the condition cohorts and from 120,465 to 292,631 in WC control groups. All incremental WC cost differences between condition and control cohorts were significant except incremental costs associated with FD ( $P > 0.05$ ). Gout had the highest incremental annual costs (\$813), while GERD had the most annual incremental absence days (0.80). FD had the lowest incremental WC costs (-\$377) and absence days (-0.36).

**CONCLUSIONS:** Most of the conditions studied were associated with significant incremental WC costs and absence days, even though they are not thought of as common workplace injuries or illnesses. Employees with GERD were among those with the highest incremental WC costs and days absent. Further research is required to determine if the incremental WC costs and days occur because these conditions cause employees to be more susceptible to workplace injury or if they occur because employees with these conditions are more knowledgeable about using health benefits.

Citation Brook RA, Kleinman NL, Melkonian AK, Smeeding JE. Comparisons of Employee Workers' Compensation Costs and Absence Days Using a National Database. *Value Health* 2010;13(3):A90

Presented at the International Society for Pharmacoeconomics and Outcomes Research's 15th Annual Meeting, May 18, 2010, Atlanta, GA

**The Presentation Supported by:** The JeSTARx Group

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## BACKGROUND:

- Most employers in the United States are required to purchase workers' compensation (WC) insurance.
- Employee illnesses stemming from workplace conditions and injuries occurring on-the-job are covered under WC.
- Employees filing a WC claim can receive payment for WC claim-related medical expenses and a portion of salary while absent from work. The portion of salary received is determined on a state-by-state basis.

## OBJECTIVE:

- To compare the incremental costs and absences due to WC between controls (employees without the conditions) and employees with the following conditions:
  - bipolar disorder (BPD), other mental disorders (OMD), chronic constipation (CC), functional dyspepsia (FD), gastroesophageal reflux disease (GERD), gout, Hepatitis-C (HCV), and insomnia.

## METHODS:

- A 2001-2007 US employee database was used to identify subjects with the different study conditions.
  - Subjects were identified with the conditions listed in **Table 1** if they had any medical claims with the primary, secondary, or tertiary diagnosis listed in the table.
  - An insomnia diagnosis was also made if subjects had a prescription for ramelteon, zaleplon, zolpidem, eszopiclone, flurazepam, triazolam, estazolam, quazepam, or temazepam.
- Costs and absence days were measured during the year following each employee's index date.
- Index dates were assigned for all subjects.
  - In condition groups, index dates were the date of the employees' first diagnosis (by condition), except for FD where the index date was 3 months prior to the first FD diagnosis.
  - Controls (by study) used the average index date of subjects with the condition.
- All studies used two-part regression analysis to model the cost differences between employees with the condition and control groups (employees without the condition).
  - Part 1: Logistic regression was used to model the probability of having any cost or absence.
  - Part 2: Generalized linear models with gamma distributions and log link functions were used to model costs and absence days among employees with costs or absences.

- Outputs from both models were combined to yield adjusted average cost and absence day estimates for all employees in each cohort.
- The models controlled for population differences in age, sex, marital status, race, exempt/non-exempt status (exempt employees are not paid on an hourly basis and are not paid for overtime work), full-time/part-time status, salary, Charlson Comorbidity Index,<sup>1</sup> and geography (defined by the first digit of the employee's postal zip code).
- WC costs included:
  - salary replacement payments made to the employee and
  - associated medical payments
- All costs adjusted to 2007 US\$.
- WC absence days included all days from claims begun at some point during the year following the index date.
- Incremental costs and absences were defined as adjusted differences between the condition cohort and controls.
- Differences were considered significant if  $P \leq 0.05$ .

## RESULTS:

- Numbers of employees with WC coverage varied from 339 to 17,714 in the condition cohorts and from 120,465 to 292,631 in control groups (**Table 2**).
- All WC cost differences (**Table 3**) between condition and control cohorts were significant ( $P < 0.05$ ) except incremental costs associated with CC ( $P > 0.05$ ).
  - The highest incremental annual WC costs (**Figure 1**) were for Gout (\$813), and FD had the lowest (-\$377).
- WC absence time differences (Table 4) between condition and control cohorts were significant ( $P < 0.05$ ) in the cases of BPD, OMD, GERD, and insomnia.
  - The highest incremental annual absence days (**Figure 2**) were for GERD (0.80), while the lowest were for FD (-0.36).

## CONCLUSION:

- Most of the conditions studied were associated with significant incremental WC costs and absence days, even though they are not thought of as common workplace injuries or illnesses.
- Employees with GERD were among those with the highest incremental WC costs and days absent.
- Further research is required to determine if the incremental WC costs and days occur because these conditions cause employees to be more susceptible to workplace injury or if they occur because employees with these conditions are more knowledgeable about using health benefits.

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**TABLE 1: ICD-9 CODES USED IN THE STUDY**

Condition	ICD-9 descriptions and codes
Bipolar disorder (BPD)	Manic Disorders: 296.0x, 296.1x; Bipolar Affective Disorders: 296.4x, 296.5x, 296.6x, 296.7x; Manic-depressive psychosis, other, and unspecified: 296.8x
Other Mental Disorders (OMD)	Codes within the Agency for Healthcare Research and Quality [AHRQ] diagnosis chapter 'Mental Disorder' excluding codes for BPD
Chronic Constipation (CC)	Constipation: 564.0; Constipation, unspecified: 564.00; Slow transit constipation: 564.01; Other constipation: 564.09
Functional Dyspepsia (FD)	536.8x
Gastroesophageal Reflux Disease (GERD)	Hypersecretory condition: 251.5; Esophagitis: 530.10, 530.1, 530.11, 530.12, 530.19; Esophageal reflux: 530.81; Heartburn: 787.1; Dysphagia – Complete: 787.2
Gout	274.xx
Hepatitis-C (HCV)	Acute HCV with hepatic coma, 070.41; Chronic HCV with hepatic coma, 070.44; Acute HCV without mention of hepatic coma, 070.51; Chronic HCV without mention of hepatic coma, 070.54; Unspecified viral HCV, 070.7x
Insomnia	Transient disorder of initiating or maintaining sleep: 307.41; Persistent disorder of initiating or maintaining sleep: 307.42; Subjective insomnia: 307.49; Insomnia: 780.52

**TABLE 2: COHORT SAMPLE SIZES**

Condition	Sample Size Study cohort	Sample Size Controls
Bipolar disorder (BPD)	339	148,910
Chronic Constipation (CC)	1,907	272,024
Functional Dyspepsia (FD)	1,537	249,639
Gastroesophageal Reflux Disease (GERD)	10,790	232,281
Gout	1,085	224,723
Hepatitis-C (HCV)	1,494	292,631
Insomnia	16,518	258,669
Other Mental Disorders (OMD)	17,714	120,465

**TABLE 3: WORKERS' COMPENSATION COSTS**

Condition	Annual Cost (\$) Study cohort	Annual Cost (\$) Controls
Bipolar disorder (BPD) <sup>†</sup>	\$481	\$185
Chronic Constipation (CC)	\$837	\$769
Functional Dyspepsia (FD) <sup>†</sup>	\$739	\$1,117
Gastroesophageal Reflux Disease (GERD) <sup>‡</sup>	\$1,392	\$1,056
Gout <sup>‡</sup>	\$1,756	\$943
Hepatitis-C <sup>†</sup>	\$359	\$286
Insomnia <sup>‡</sup>	\$406	\$236
Other Mental Disorders (OMD) <sup>†</sup>	\$242	\$189

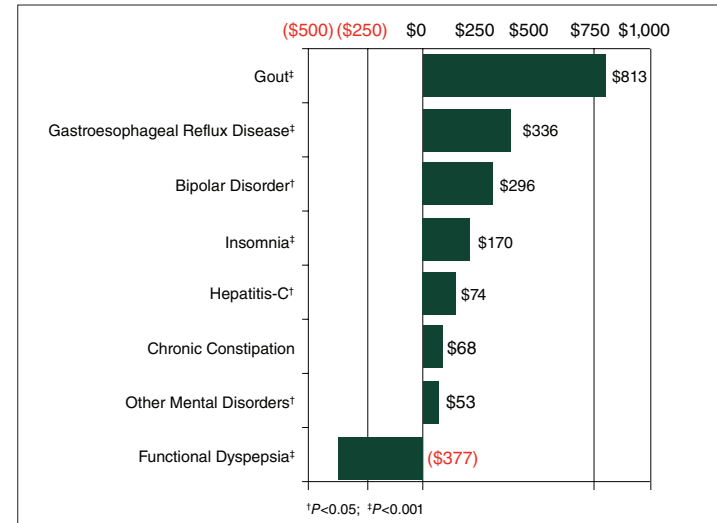
<sup>†</sup>P<0.05 vs. Controls; <sup>‡</sup>P<0.001 vs. Controls

**TABLE 4: WORKERS' COMPENSATION ABSENCE DAYS**

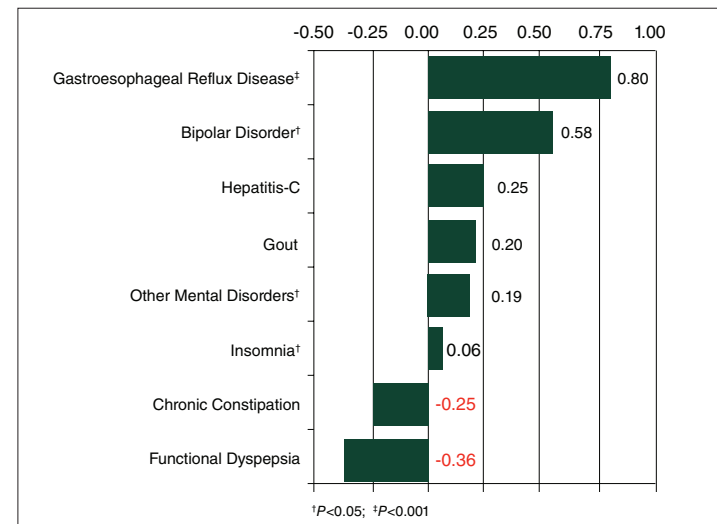
Condition	Annual Absence (Days) Study cohort	Annual Absence (Days) Controls
Bipolar disorder (BPD) <sup>†</sup>	1.31	0.72
Chronic Constipation (CC)	1.30	1.55
Functional Dyspepsia (FD)	1.33	1.69
Gastroesophageal Reflux Disease (GERD) <sup>‡</sup>	2.45	1.66
Gout	1.64	1.44
Hepatitis-C (HCV)	0.63	0.38
Insomnia <sup>†</sup>	0.34	0.28
Other Mental Disorders (OMD) <sup>†</sup>	0.83	0.64

<sup>†</sup>P<0.05 vs. Controls; <sup>‡</sup>P<0.001 vs. Controls

**FIGURE 1. INCREMENTAL ANNUAL WORKERS' COMPENSATION COSTS PER EMPLOYEE**



**FIGURE 2. INCREMENTAL ANNUAL WORKERS' COMPENSATION DISABILITY ABSENCE DAYS PER EMPLOYEE**



## References

<sup>1</sup> Charlson ME, Pompei P, Ales KL, MacKenzie GR. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. *J Chronic Dis.* 1987;40(5):373-83