

# COSTS, ABSENCES, PREVALENCE AND IMPACT OF BIPOLAR DISORDER, OTHER MENTAL DISORDERS, CHRONIC CONSTIPATION, FUNCTIONAL DYSPEPSIA, GASTROESOPHAGEAL REFLUX DISEASE, GOUT, AND INSOMNIA

Richard A. Brook, MS, MBA;<sup>1</sup> Nathan L. Kleinman, PhD;<sup>2</sup> Jim E. Smeeding, RPh, MBA<sup>3</sup>

<sup>1</sup>The JeSTARx Group, 18 Hirth Drive, Newfoundland, NJ 07435-1710, USA, RBrook@JeSTARx.com; <sup>2</sup>HCMS Group, LLC Cheyenne, WY, USA; <sup>3</sup>The JeSTARx Group, Dallas, TX, USA

Rich Brook  
The JeSTARx Group  
RBrook@JeSTARx.com  
973-208-8621

## Background

- Health conditions impact employers' costs across a number of benefit types.
- Publications with objective data comparing conditions are limited.
- To assess the impact of different conditions, it is advisable to compare their impact using objective data and similar methodologies.

## Objectives

- To compare the costs, absences, and prevalence for employees with bipolar disorder (BPD), other mental disorders (OMD), chronic constipation (CC), functional dyspepsia (FD), gastroesophageal reflux disease (GERD), gout, and insomnia.
- To project the costs and absences of these conditions to a hypothetical cohort of 1000 employees.

## Methods

- 2001-2010 data from a US employee database were used to identify subjects with the study conditions and controls (employees without each disease).
- All studies performed from the perspective of the employer
- All study subjects were identified by the presence (or lack) of ICD-9 claims for the conditions based on Table 1.
- The insomnia study also identified subjects based on certain prescription medications.
- Absences were based on reported hours or days of missed work. All absence information (lost time and cost) came from payroll and disability records.
- Direct costs included medical and prescription drug claims from adjudicated (paid) claims data.
- Absence costs (due to Sick Leave, Short- and Long-term Disability, and Workers' Compensation) were based on payments to the employee.
- All studies used two-part regression models to control for differences between subjects with and without each condition:
  - Part 1: Logistic regression to predict the likelihood of subjects having any costs (or absences).
  - Part 2: for subjects with more than zero costs (or absences):
    - Generalized linear models (GLMs) were used with a gamma ( $\gamma$ ) distribution and a log link function to model costs, and
    - Log-linear models were used for the BPD and OMD studies.
- The Prevalence of a Condition was defined as:

$$\frac{\text{Employees with Condition}}{\text{Employees with and without (controls) Condition}}$$

- Incremental costs and absences were calculated as regression-adjusted differences between the cohorts (employees with the condition minus employees without the condition).
- All costs were adjusted to 2010 US dollars using non-seasonally adjusted Consumer Price Indices (CPIs) for medical services, prescription drugs, and all consumer goods.
- Differences were considered significant at  $P < 0.05$ .
- Cost and prevalence data were combined to project the impact across a population of 1000 employees.

Figure 1. Prevalence of Study Conditions

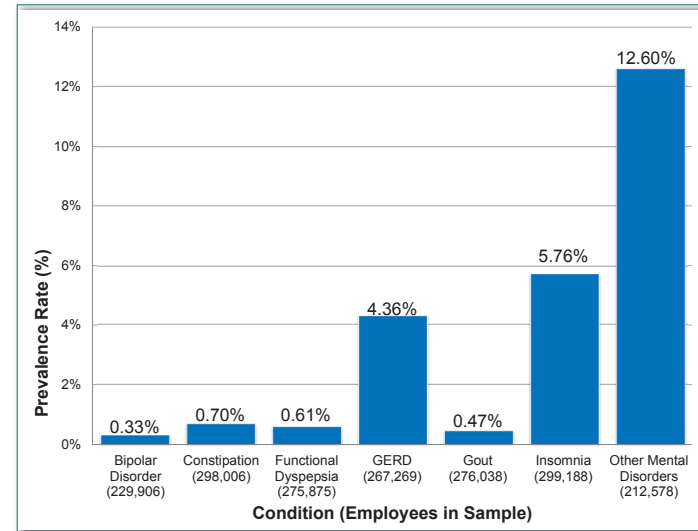


Table 1. Condition ICD-9 codes

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)	Non-bipolar disorder codes within the Agency for Healthcare Research and Quality [AHRQ] diagnosis chapter 'Mental Disorders'
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
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

\*The insomnia study's clinical criteria also allowed inclusion of employees with prescriptions for the hypnotic agents eszopiclone, ramelteon, zaleplon, and zolpidem (without an ICD-9 for insomnia) to be included.

Figure 2. Annual Incremental Lost Time by Components and Condition

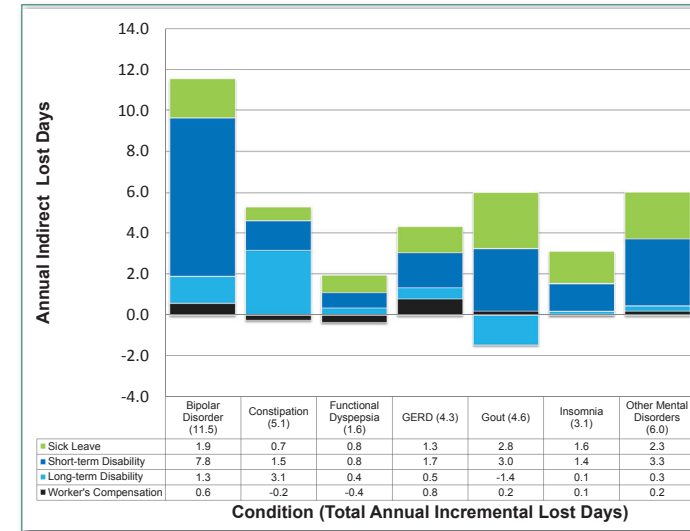


Table 2. Incremental costs (of employees with minus employees without the condition):

Cost Component	Incremental costs (of employees with minus employees without the condition):						
	Bipolar Disorder	Constipation	Functional Dyspepsia	GERD	Gout	Insomnia	Other Mental Disorders
<b>Direct Components</b>							
Healthcare (Medical)	\$5,348	\$3,292	\$4,739	\$3,003	\$1,941	\$827	\$3,410
Prescription	\$2,394	\$475	\$468	\$716	\$548	\$809	\$970
<b>Total Direct Costs</b>	<b>\$7,742</b>	<b>\$3,766</b>	<b>\$5,207</b>	<b>\$3,719</b>	<b>\$2,489</b>	<b>\$1,635</b>	<b>\$4,380</b>
<b>% of Total Costs</b>	<b>85.2%</b>	<b>88.9%</b>	<b>102.6%</b>	<b>83.0%</b>	<b>60.6%</b>	<b>73.5%</b>	<b>87.0%</b>
<b>Indirect Components</b>							
Sick Leave	\$97	\$133	\$125	\$176	\$372	\$217	\$181
Short-term Disability	\$808	\$198	\$125	\$206	\$433	\$186	\$393
Long-term Disability	\$130	\$66	\$9	\$32	\$30	\$10	\$26
Worker's Compensation	\$307	\$71	(\$391)	\$349	\$843	\$177	\$55
<b>Total Indirect Costs</b>	<b>\$1,342</b>	<b>\$468</b>	<b>(\$132)</b>	<b>\$763</b>	<b>\$1,618</b>	<b>\$590</b>	<b>\$655</b>
<b>% of Total Costs</b>	<b>14.8%</b>	<b>11.1%</b>	<b>(-2.6%)</b>	<b>17.0%</b>	<b>39.4%</b>	<b>26.5%</b>	<b>13.0%</b>
<b>Total Costs*</b>	<b>\$9,085</b>	<b>\$4,236</b>	<b>\$5,075</b>	<b>\$4,481</b>	<b>\$4,107</b>	<b>\$2,226</b>	<b>\$5,034</b>

\*Differences due to rounding <sup>1</sup>P < 0.05; <sup>2</sup>P < 0.01; <sup>3</sup>P < 0.0001 \*Significance not evaluated

Table 3. Projections to Typical Employer with 1000 Employees

	Prevalence	Total Incremental Cost per Employee	Cost as % of Average Cost	Projected Cost for 1000 Employees	Projected Cost as % of Average Projected Cost	Total Incremental Days	Projected Incremental Days	Projected Days as % of Average Projected Days
Bipolar disorder	0.33%	\$9,085	185.7%	\$29,981	19.7%	11.5	38.0	21.7%
Constipation	0.70%	\$4,236	86.6%	\$29,652	19.4%	5.1	35.7	20.4%
Functional Dyspepsia	0.61%	\$5,075	103.7%	\$30,958	20.3%	1.6	9.8	5.6%
GERD	4.36%	\$4,481	91.6%	\$195,372	128.1%	4.3	187.5	107.0%
Gout	0.47%	\$4,107	84.0%	\$19,303	12.7%	4.6	21.6	12.3%
Insomnia	5.76%	\$2,226	45.5%	\$128,218	84.1%	3.1	178.6	101.9%
Other Mental Disorders	12.60%	\$5,034	102.9%	\$634,284	415.8%	6.0	756.0	431.3%
<b>Average</b>		<b>\$4,892</b>		<b>\$152,538</b>			<b>175.3</b>	

## Results

- The prevalence for each condition is plotted in Figure 1 with the size of the sample (employees with and without the condition) included on the x-axis label.
- From highest to lowest prevalence: OMD, Insomnia, GERD, Chronic Constipation, Functional Dyspepsia, Gout and Bipolar Disorders.
- Table 2 presents the annual incremental costs for all conditions by component.
  - The employees with Bipolar Disorder had the highest incremental costs (\$9085), and the employees with insomnia (\$2226) had the lowest incremental costs among the conditions studied.
  - The disease cohorts were more expensive than the control cohorts for all conditions and metrics except:
    - Workers' Compensation costs for the employees with Functional Dyspepsia, and
    - Long-term Disability costs for the employees with Gout.
  - Most incremental cost differences were significant with the exceptions being Workers' Compensation associated with Constipation and Long-term Disability associated with Functional Dyspepsia.
  - As a percentage of all incremental costs, incremental indirect costs were highest for employees with Gout (39.4%).
- Figure 2 presents the annual incremental absence days for all conditions by component.
  - Bipolar Disorder was associated with the most incremental absence days (11.5), with the highest percentage under the STD benefit.
  - Similar to the cost data, the employees with Functional Dyspepsia had fewer Workers' Compensation days than controls (as did employees with Constipation), and the employees with Gout had fewer annual Long-term Disability days than controls.
  - The following incremental absences were not significant:
    - Short- and Long-term Disability days associated with Functional Dyspepsia, and
    - Long-term Disability days associated with GERD and Insomnia, and
    - Workers' Compensation for Bipolar Disorders, Constipation, Functional Dyspepsia, Gout, and Other Mental Disorders.
- Using actual absence payments (not based on proxies or subjective data which are subsequently monetized) some interesting findings include:
  - Bipolar disorder was associated with the most annual incremental absence days (11.5) but the second most annual incremental absence costs (\$1343).
  - Gout had the highest incremental absence costs (\$1618), but ranked 4th in incremental absence days.
- Table 3 presents the projected annual impact of these conditions on a hypothetical 1000 employee cohort.
  - While the employees with Bipolar Disorder had the highest incremental costs (\$9085), it impacts a small percentage of the population, resulting in only \$29,981 in projected annual costs.
  - Across the projected population, FD was responsible for only 9.76 absence days per year, while Other Mental Disorders was responsible for 756 annual absence days—nearly 3 full-time equivalent employees!

## Conclusions

- This research highlights the need to report not just the costs for those with a condition, but also the costs for controls, and the prevalence of the condition.
- Examining the projected budget impact enables organizations to make better coverage decisions.

Author disclosures: None.  
This research may be cited as: Brook RA, Kleinman NL, Smeeding JE. Cost, Absences, Prevalence and Impact of Bipolar Disorder, Other Mental Disorders, Chronic Constipation, Functional Dyspepsia, Gastroesophageal Reflux Disease, Gout, and Insomnia. J Manag Care Pharm. September 2011; 17(7):556.  
This poster can be downloaded from: <http://jeSTARx.com/publications.htm>  
These data have recently been accepted for publication as: Brook RA, Kleinman NL. Human Capital Costs and Absenteeism Among Employees with Various Conditions. In: Human Capital and Resources, Editors: Michael F. Rizzo and Andrea Gallo. ISBN 978-1-61470-898-8 © 2011 Nova Science Publishers, Inc. (Nova Science Publishers, Inc. 400 Oser Avenue, Suite 1600, Hauppauge, NY 11788-3619)