

HEALTH CARE COST COMPARISONS BY POINT OF SERVICE FOR EMPLOYEES WITH OR WITHOUT INSOMNIA

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INTRODUCTION

Insomnia is associated with substantial health-related costs that can pose a significant financial burden on employers.¹ Recent studies have suggested that total direct costs for insomnia in the US may be approximately \$15 billion annually.^{2,3} Understanding which areas of the health care system are utilized most by adults with insomnia is important for managed care payers in order to effectively contain costs. However, few studies have looked at the direct costs of insomnia by individual medical point of service. The current study compares the direct costs of doctor's office visits, inpatient hospital visits, outpatient hospital/clinic visits, emergency department visits, laboratory fees, and prescription drug costs between employees with and without insomnia.

METHODS

- A retrospective analysis was performed on data (2001 to 2006) from the Human Capital Management Services (HCMS) Research Reference Database consisting of approximately 510,000 employees representing the retail, service, manufacturing, and financial industries.
- Annual direct point-of-service costs were collected from claims data for doctor's offices, inpatient hospitals, outpatient hospitals/clinics, emergency departments, laboratories, pharmacies, and other medical locations.
- Only employees with health claims identifying specific points of service were included in the analysis.
- Comparisons were made between 2 groups:
 - The insomnia group consisted of employees with a record of an insomnia diagnosis, identified by the presence of *International Classification of Diseases*, 9th Revision (ICD-9) diagnostic codes or prescriptions for a hypnotic agent.
 - ICD-9 codes used to identify employees with a primary, secondary, or tertiary diagnosis included: 307.41 (transient disorder of initiating or maintaining sleep), 307.42 (persistent disorder of initiating or maintaining sleep), 307.49 (subjective insomnia), and 780.52 (insomnia).
 - Hypnotic agents included ramelteon, zaleplon, zolpidem, and eszopiclone.
 - The non-insomnia group (control) consisted of employees with no record of an insomnia diagnosis (ICD-9 codes) and no prescription for a hypnotic agent.
- The index date in the insomnia group was defined as the date of first diagnosis of insomnia or initial hypnotic prescription.
- The average index date in the insomnia group was used as the index date for the control group.
- Employees in both groups were compared over the 12 months following the index date.
- Employees included in the analysis were required to be continuously employed and eligible for health benefits for at least 12 months after their index date.

- Direct point-of-service costs were compared between the insomnia and control groups for the following services:
 - Doctor's office visits
 - Inpatient hospital visits
 - Outpatient hospital/clinic visits
 - Emergency department visits
 - Laboratory fees
 - Prescription drug costs
 - Other (ambulance, home health care services)

Statistical Analysis

- A two-part regression analysis was used to compare the cost differences between the insomnia and control groups using separate regression models for each of the 7 outcomes measures.
- The models controlled for population differences in age, sex, marital status, race, exempt/non-exempt work status, full-time/part-time status, salary, comorbid mental disorders, Charlson Comorbidity Index,⁴ and geography (defined by the first digit of the employee's postal zip code).
- All costs were adjusted to 2006 dollars.
- Demographic comparisons between groups were made using *t* tests for continuous variables and chi-square (χ^2) tests for binary variables.
- Differences were considered significant if $P < 0.05$.

RESULTS

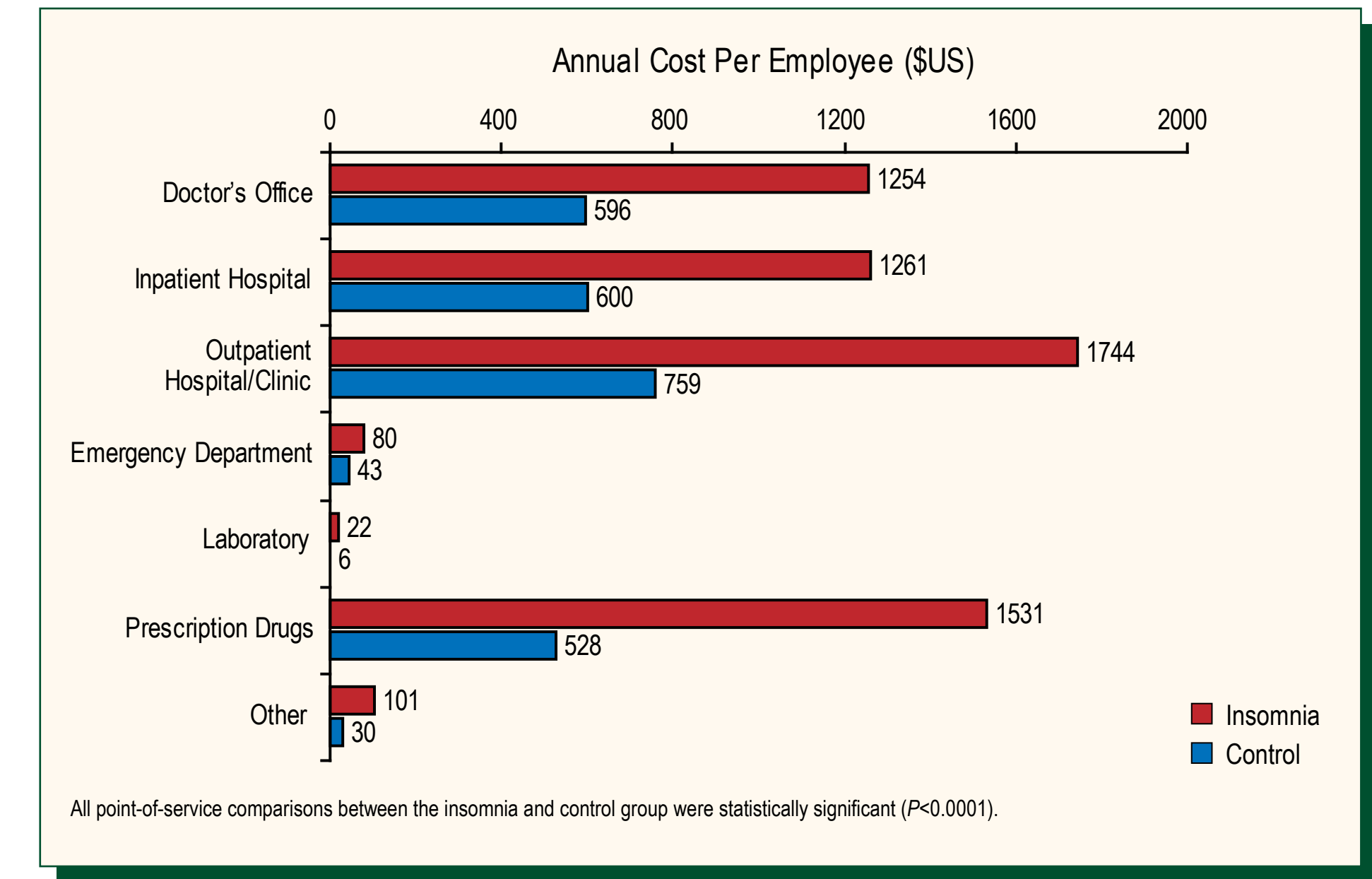
- A total of 111,385 employees were included in this analysis, of which 7,511 were assigned to the insomnia group. Demographics for both the insomnia and control groups are detailed in Table 1.
- Employees with insomnia incurred significantly greater direct costs for all medical points of service compared with employees without insomnia ($P < 0.0001$) (Figure 1).

Table 1. Demographic Differences Between Employees With and Without Insomnia

Category	Insomnia Group		Control Group		Difference ^{a,b}
	n	Mean ^b (SE)	n	Mean ^b (SE)	
Age at index date (years)	7,509	42.4 (0.11)	103,858	40.8 (0.03)	1.65
Annual salary (\$US)	7,509	63,720 (543)	103,817	51,404 (138)	12,316
Female gender (%)	7,511	58.2 (0.6)	103,874	46.8 (0.2)	11.4
Married (%)	7,418	56.5 (0.6)	101,272	54.2 (0.2)	2.2
Race	7,509		103,825		
White (%)		72.6 (0.5)		57.3 (0.2)	15.3
Black (%)		6.0 (0.3)		10.9 (0.1)	-4.9
Hispanic (%)		10.4 (0.4)		11.8 (0.1)	-1.4
Exempt status (%)	7,511	45.3 (0.6)	103,874	30.1 (0.1)	15.2
Full-time employee (%)	7,511	97.6 (0.2)	103,874	96.7 (0.1)	0.8

^aAll comparisons, except married %, were significant ($P < 0.001$).
^bNumbers have been rounded; differences are based on original numbers.
 SE = Standard Error

Figure 1. Comparison of Costs by Point of Service Between Employees With and Without Insomnia



CONCLUSIONS

- Employees with insomnia incurred significantly higher total direct costs across every point of service than those without insomnia.
- These results indicate an opportunity for improved management of employees with insomnia, which may result in reduced costs from an employer perspective.

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