

# COMPARISONS OF RELATIVE RISKS OF SERIOUS COMORBIDITIES AMONG EMPLOYEES WITH AND WITHOUT INSOMNIA, GERD, HEPATITIS C, MULTIPLE SCLEROSIS, AND CHRONIC CONSTIPATION

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## Introduction:

- Often disease-specific studies report on the impact of comorbidities
- Comorbidity definitions across retrospective studies are rarely standardized and often limited to single diagnostic categories.
- Recent research has been presented on the prevalence and costs of 10 comorbidities using the AHRQ Categorization.<sup>1</sup>

## Objective:

- To compare the relative risks of 12 serious coexisting health conditions among employees with insomnia, gastroesophageal reflux disease (GERD), hepatitis C (HCV), multiple sclerosis (MS), or chronic constipation (CC).

## Methods:

- The employees included in this research project came from the Human Capital Management Services Research Reference Database (HCMS RRD).
- Data for these employees come from multiple large employers that are widely dispersed throughout the United States and represent the retail, service, manufacturing, and financial industries.
- The results presented are taken from several different studies of different conditions with data from 2001 to 2007.
- Persons were considered to have a condition if they had a health insurance claim with an ICD-9-CM code for the condition or a prescription for a product specifically related to the condition (**Table 1**). Persons were considered eligible for the comparison control cohort if they had no insurance claims with an ICD-9 code or a prescription for the condition.
- The annual period of analysis for each disease state is described in **Table 2**.
- For each condition, controls were matched on demographics, job-information, geography, and the Charlson Comorbidity Index.<sup>2</sup> For each employee, 12-month post-index date

medical claims were assigned to 261 Agency for Healthcare Research and Quality (AHRQ) condition categories using ICD-9 codes.<sup>3</sup>

- Prevalence of these conditions was compared within the five pairs of matched disease/non-disease cohorts.
- Conditions analyzed were based on prior research using the AHRQ categories for costly conditions in the United States.<sup>1</sup>
- Relative risk is calculated as the probability the disease cohort has the AHRQ condition divided by the probability that the control cohort has the AHRQ condition.

## Results:

- The numbers of employees with disease and matched employees without disease are presented in **Table 2**.
- For employees with and without insomnia, GERD, HCV, MS, or CC (Figures 1-5), respective relative risks (\*P<0.05) were calculated for:
  - Coronary Atherosclerosis (1.8\*, 2.2\*, 1.3\*, 1.7\*, 1.6\*)
  - Hyperlipidemia (1.6\*, 1.8\*, 0.9, 1.2\*, 1.7\*),
  - Acute cerebrovascular disease (3.4\*, 2.3\*, 0.9, 7.8\*, 2.5\*),
  - Diabetes without complications (1.4\*, 1.4\*, 1.5\*, 0.9, 1.2),
  - Diabetes with complications (1.3\*, 1.3\*, 1.9\*, 0.9, 1.5\*),
  - Chronic obstructive pulmonary disease (2.0\*, 2.0\*, 1.7\*, 1.4, 1.4\*),
  - Asthma (2.1\*, 2.5\*, 1.3, 1.1, 1.6\*),
  - Rheumatoid arthritis (2.0\*, 2.1\*, 2.5\*, 1.8, 2.9\*),
  - Osteoarthritis (2.2\*, 2.1\*, 1.6\*, 1.3, 1.8\*),
  - Osteoporosis (1.7\*, 1.7\*, 1.4, 2.6\*, 2.3\*), and
  - Neoplasms (1.4\*, 1.8\*, 1.5\*, 1.4\*, 2.0\*).

## Conclusions:

- Employees with insomnia, GERD, HCV, MS, or CC have many more serious comorbidities than employees without these diseases.
- Further investigation is warranted over an extended period of time to confirm this relationship.

**Table 1 Inclusion Criteria for Study Cohorts**

Disease	Condition: ICD-9 Code	Prescription Products
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	NA
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	NA
Insomnia	Insomnia (nonorganic origin)/ transient 307.41 Insomnia (nonorganic origin), persistent (Primary) 307.42 Insomnia, subjective complaint 307.49 Insomnia 780.52	OR ramelteon, zaleplon, zolpidem, eszopiclone, flurazepam, triazolam, estazolam, or temazepam
Chronic Constipation	Constipation 564.0 Unspecified Constipation, 564.00 Slow Transit Constipation, 564.01 Other Constipation, 564.09	NA
Multiple Sclerosis	Multiple Sclerosis, 340.xx	NA

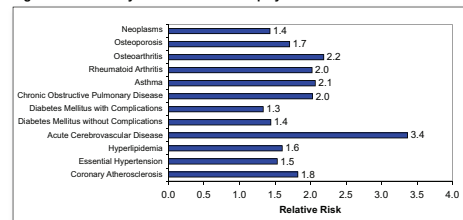
NA = While prescription drugs are a component of treatment, the use of any product was not required for inclusion in the study.

**Table 2 Annual Period Definitions for Study Cohorts and Sample Sizes**

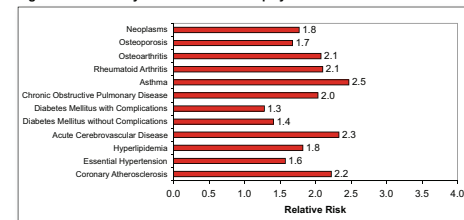
Disease	12 Month Period beginning	Condition (N)	Match Rate	Controls (N)
GERD	At initial diagnosis	11,653	10:1	116,530
Hepatitis-C (HCV)	At initial diagnosis	1329	20:1	26,580
Insomnia	At initial diagnosis or prescription	17,230	1:1	17,230
Chronic Constipation	Three months prior to initial diagnosis	1215	24:1	29,160
Multiple Sclerosis	At initial diagnosis or prescription therapy initiation date for a Drug Modifying Treatment (DMTs): • Avonex [IFN-β1a IM]; • Betaseron [IFN-β1b]; • Copaxone [glatiramer acetate]; and • Rebif [IFN-β1a SC].	765	20:1	15,300

IFN=Interferon

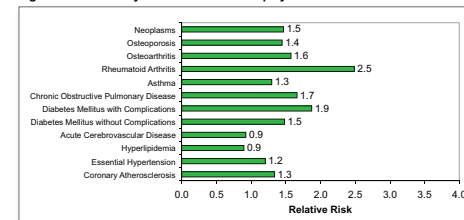
**Figure 1: Comorbidity Relative Risks for Employees with and without Insomnia**



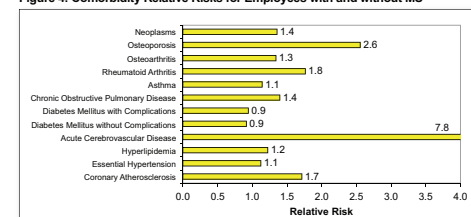
**Figure 2: Comorbidity Relative Risks for Employees with and without GERD**



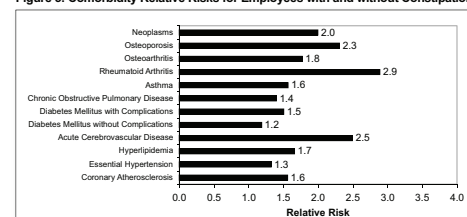
**Figure 3: Comorbidity Relative Risks for Employees with and without HCV**



**Figure 4: Comorbidity Relative Risks for Employees with and without MS**



**Figure 5: Comorbidity Relative Risks for Employees with and without Constipation**



## References

- <sup>1</sup>Thorpe KE, Howard DH, Galactionova K. Differences in disease prevalence as a source of the U.S.-European health care spending gap. *Health Aff (Millwood)*. 2007 Nov-Dec;26(9):w678-86. Epub 2007 Oct 2
- <sup>2</sup>Charlson ME, et al. A new method of classifying prognostic comorbidity in longitudinal studies: development and validation. *J Chronic Dis*. 1987;40:373-83.
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## Disclosures

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