

# PATIENTS WITH BIPOLAR DISORDER AT HIGHER RISK FOR WIDE RANGE OF PHYSICAL COMORBIDITIES

June 2009

## HIGHLIGHTS

- Compared to patients with no mental health diagnoses, those with a bipolar diagnosis were at greater risk for a wide range of physical comorbidities.
- Bipolar patients' risk for trauma and iatrogenic conditions — conditions such as poisoning, adverse drug reactions, and injury — was 3.13 times that of patients with no mental health diagnoses.
- Endocrine and metabolic diseases, such as diabetes, hypothyroidism, and hypoglycemia, were 1.68 times more common among patients with bipolar disorder than among those with no mental health episodes.
- Musculoskeletal and ear, nose, and throat conditions were the most common types of physical comorbidities among both bipolar patients and matched controls. However, these conditions were 59 percent and 42 percent (respectively) more likely to occur among bipolar patients than controls.

## INTRODUCTION

Bipolar disorder, a chronic illness characterized by shifts between states of mania and depression, affects approximately 2.8 percent of Americans in a given year.<sup>1,2</sup> There are two principal types of bipolar disorder: Type one involves clearly defined episodes of acute mania, while type two is characterized by periods of less severe mania, known as hypomania. The unstable moods and behavioral changes that characterize both types of the disorder disrupt an individual's ability to function and negatively impact his or her quality of life.

Recent research has shown that bipolar patients are at greater risk for somatic illnesses than the rest of the population.<sup>3,4</sup> Few studies, however, have examined the risk for medical comorbidities among persons with bipolar disorder across a range of conditions and body systems. The purpose of this analysis is to assess, among bipolar patients, the incidence of disease by general and specific diagnostic categories, and to compare the incidences to those of patients with no mental health diagnoses.

## DATA AND METHODS

This study is based on data contained in the 2006–2007 MarketScan® Commercial Claims and Encounters Database. The Thomson Reuters Medical Episode Grouper (MEG) was used to group each enrollee's claims into distinct episodes of care based on the disease for which treatment was received. For example, a series of claims for inpatient hospitalization, physician office visits, and laboratory testing pertaining to the same disease would be grouped together as one episode of the disease, as long as the time period between any of the claims did not exceed the length of time specific to the disease.



The diagnostic categories in MEG were originally developed in collaboration with researchers at Thomas Jefferson University as part of the Disease Staging™ classification system. An important feature of Disease Staging is the inclusion of complications of a disease into a single episode. Thus, retinopathy in the presence of diabetes is treated as a complication of diabetes, not as a separate episode involving the eye.

For this analysis, the case population in each year was comprised of individuals with an episode of bipolar disorder in that year; the control population included age- and sex-matched individuals with no mental health or substance abuse episodes in the given year. To be included in either group, an individual had to have 12 months of continuous insurance enrollment and be under 64 years of age. In 2006, there were 102,670 qualifying cases and 205,340 matched controls; in 2007, there were 109,124 cases and 218,248 controls. For both years, the incidence of disease by body system and by diagnostic category was calculated for the case and control groups; risk of disease for patients with bipolar disorder was determined relative to the control group.

The average incidence of disease and the average relative risk of disease for bipolar patients over the two year period are represented in Figures 1 through 3. Rectangles in Figure 1 represent general diagnostic categories. Rectangles in Figures 2 and 3 represent specific diagnostic categories within each general category. The size of each rectangle is proportional to the number of bipolar patients that have a diagnosis of that nature. The color of the rectangle indicates the risk ratio for the diagnostic category.

In our discussion below, we sometimes focus on the heightened risk of having a comorbid condition and sometimes on the frequency of the condition. Unless stated otherwise, the relative risks discussed in the text below represent the average of the 2006 and 2007 results.

## OBSERVATIONS

**Compared to patients with no mental health diagnoses, those with a bipolar diagnosis were at greater risk for a range of comorbidities. Risk of disease by body system ranged from 1.25 (for conditions of the female reproductive system) to 3.13 (for trauma or iatrogenic conditions) times that of the control group.**

### Trauma or iatrogenic conditions

Relative to patients with no mental health diagnoses, bipolar patients were at the greatest relative risk for trauma or iatrogenic conditions: Patients diagnosed with bipolar disorder were 3.13 times more likely than the control group to have a trauma or iatrogenic condition. Approximately 7 percent of all bipolar cases had at least one such episode in 2006 and 2007.

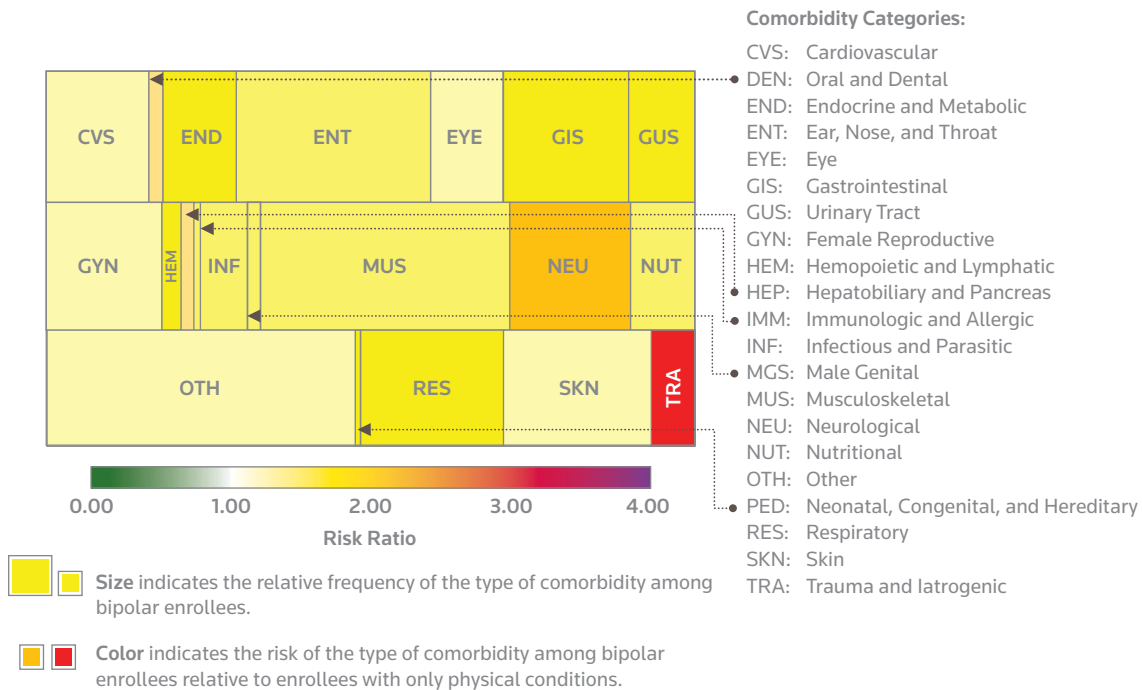
### Neurological episodes

Neurological conditions — such as headaches and spinal cord injuries — were also much more common among bipolar patients than among patients with no mental health diagnoses. These conditions occurred 2.27 times more frequently among bipolar patients — about one quarter of all enrollees with a bipolar episode also had at least one episode involving the neurological system.

### Female reproduction

Bipolar patients' relative risk was the lowest for disorders of the female reproductive system; this diagnostic category includes conditions such as dysfunctional uterine bleeding and breast cancer. However, the difference between the bipolar group and the group with no mental health diagnoses was still significant: conditions involving the female reproductive system were 25 percent more common among bipolar patients than patients with no mental health diagnoses.

**FIGURE 1: Bipolar Enrollees' Risk of Disease Relative to Matched Controls by Body System**



**Musculoskeletal conditions and ear, nose, and throat conditions were the most common types of physical comorbidities among both bipolar patients and matched controls. However, these conditions were more likely to occur among bipolar patients than controls.**

#### Musculoskeletal disorders

Musculoskeletal disorders — including disorders such as back pain, bone fractures, and osteoarthritis — were the most common physical comorbidities among bipolar patients in 2006 and 2007. These episodes occurred in almost one out of every two bipolar cases. In contrast, about one out of every three patients with no mental health diagnoses had a musculoskeletal condition.

#### Ear, nose, and throat conditions

Ear, nose, and throat diseases — including conditions such as sinusitis and pharyngitis — were the next most common type of medical condition affecting enrollees with a bipolar diagnosis. In 2006 and 2007, 37 percent of all bipolar enrollees experienced at least one ear, nose, and throat episode while only 26 percent of enrollees with no mental health diagnoses had such an episode.

**Table 1: Incidence of Disease and Relative Risk by Body System for Bipolar Cases and Matched Controls, 2006 and 2007**

BODY SYSTEM	RATE PER 1,000		RELATIVE RISK CASES TO CONTROLS
	Bipolar Cases	Matched Controls	
Trauma and Iatrogenic	72	23	3.13
Neurological	226	99	2.27
Oral and Dental	26	13	2.09
Hepatobiliary and Pancreas	25	12	2.06
Urinary Tract	125	66	1.88
Immunologic and Allergic	12	7	1.81
Hemopoietic and Lymphatic	36	20	1.79
Gastrointestinal	238	134	1.78
Respiratory	238	135	1.76
Endocrine and Metabolic	140	83	1.68
Infectious and Parasitic	87	54	1.60
Male Genital	24	15	1.59
Musculoskeletal and Connective Tissue	462	291	1.59
Nutritional	118	74	1.59
Neonatal, Congenital, and Hereditary	7	5	1.49
Ear, Nose, and Throat	370	260	1.42
Skin	247	178	1.38
Eye	137	103	1.33
Cardiovascular	195	151	1.30
Female Reproductive	214	171	1.25
Other	514	457	1.12

**Bipolar patients’ relative risk for trauma and iatrogenic conditions was higher than their risk for conditions in any other general diagnostic category. Of the specific trauma and iatrogenic conditions, poisoning, adverse drug reactions, and injury were among those that were notably more likely to occur among patients with a bipolar diagnosis than among patients with no mental health episodes.**

#### Poisonings

Patients with a bipolar diagnosis were almost 40 times more likely to have an episode of poisoning involving drugs other than antidepressants or tranquilizers than were patients with no mental health diagnoses. Two percent of all bipolar enrollees — 1,994 individuals in 2006 and 2,152 in 2007 — experienced this type of poisoning. In contrast, only 0.05 percent of the control group — 110 individuals in 2006 and 101 in 2007 — had such an episode in either year.

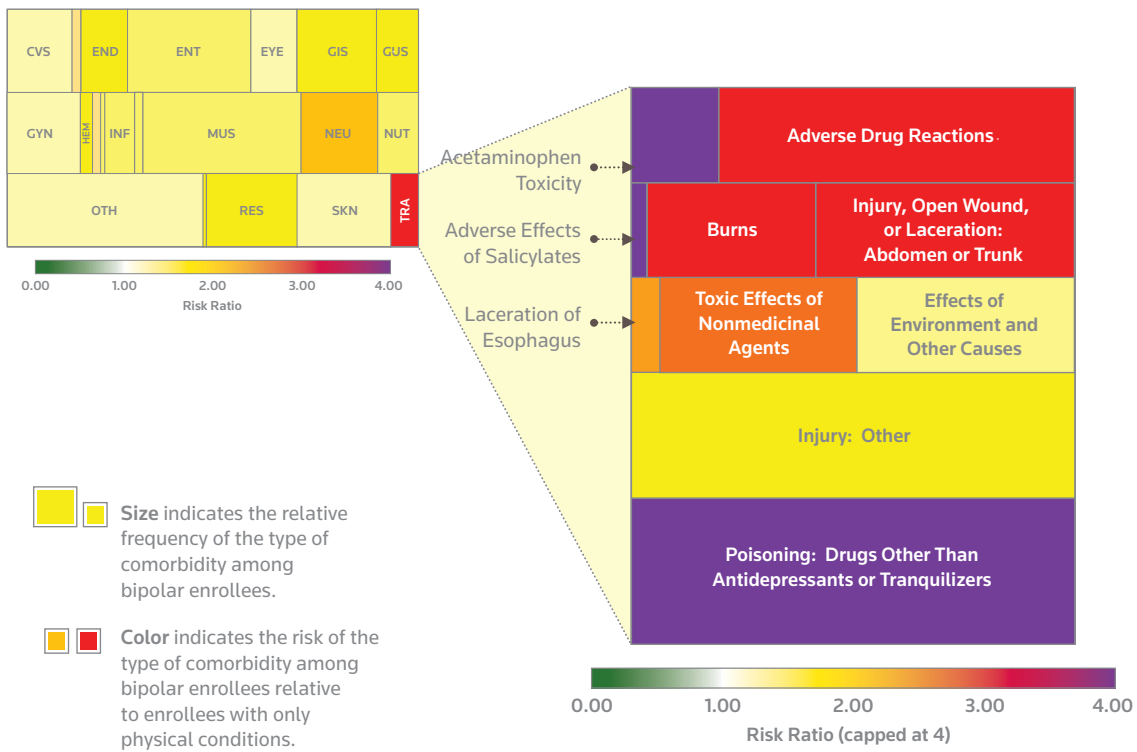
#### Adverse drug reactions

Adverse drug reactions occurred in 1 percent of all bipolar patients; these episodes were 3.22 times more likely to occur among bipolar patients than among patients with no mental health diagnoses.

#### Injuries

Bipolar patients were more likely to have at least one injury episode than patients with no mental health diagnoses; the relative risk for injury varied by type of injury. Injuries, open wounds, and blunt trauma to the abdomen or trunk were 2.99 times more common among bipolar patients than among the control group; craniocerebral injury was 3.53 times more common; and thoracic spine and spinal cord injuries were 2.08 times more common.

**FIGURE 2: Bipolar Enrollees' Risk of Trauma and Iatrogenic Conditions Relative to Matched Controls**



Endocrine diseases, which are associated with the occurrence and treatment of bipolar disorder, were 1.68 times more likely to occur among patients with bipolar disorder than among patients with no mental health episodes.

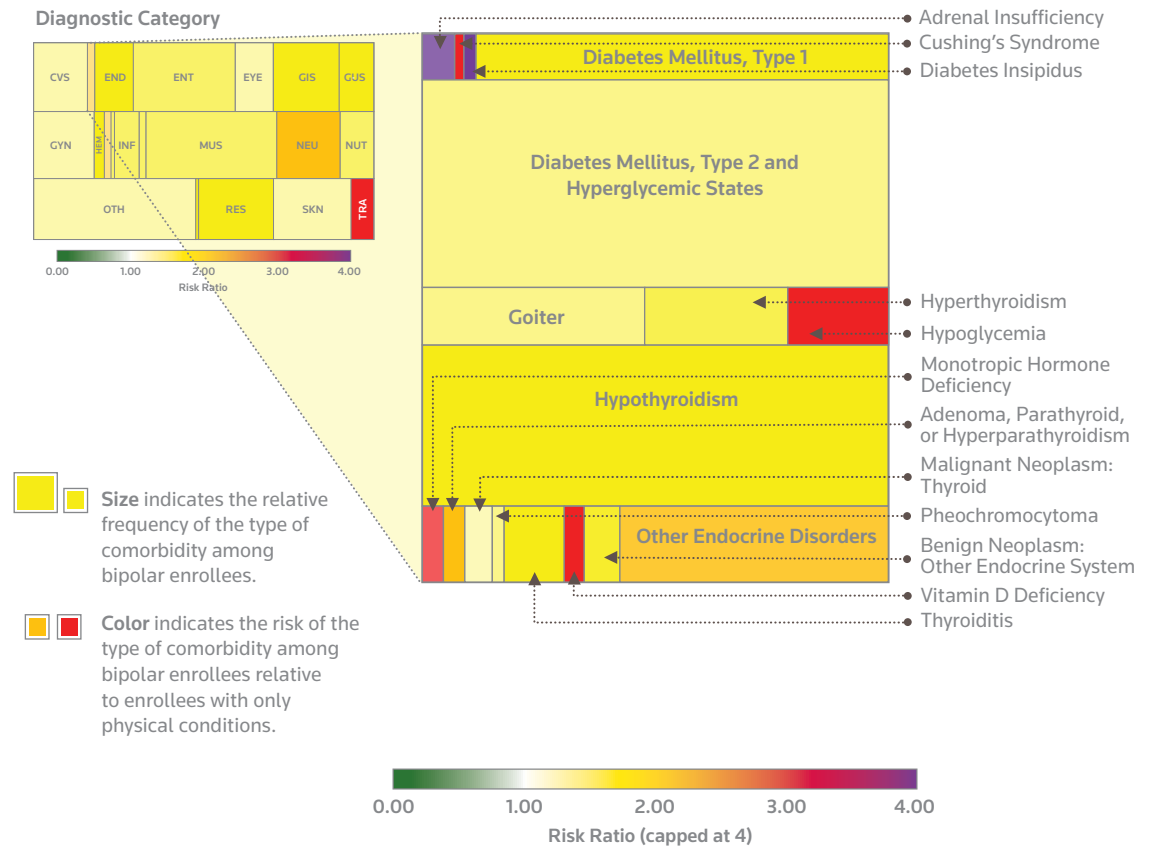
### Type 2 diabetes

The most common endocrine disorder among bipolar individuals — type 2 diabetes — occurred in approximately 6 percent of these patients. In contrast, type 2 diabetes occurred in only 4 percent of patients with no mental health diagnoses. The greater risk for type 2 diabetes among bipolar patients could be associated with bipolar patients' greater risk for obesity: these patients were 2.83 times more likely to have a medical episode attributed to obesity than the control group.

### Other endocrine disorders

Hypothyroidism affected 4 percent of the bipolar group, and the risk of hypothyroidism among bipolar patients was 2.07 times that of those with no mental health diagnoses. Bipolar patients were also at much higher risk for less common endocrine disorders including diabetes insipidus (relative risk of 7.20 for bipolar patients) and adenoma, parathyroid, or hyperparathyroidism (relative risk of 2.28 for bipolar patients).

**FIGURE 3: Bipolar Enrollees' Risk of Endocrine Conditions Relative to Matched Controls**



**LIMITATIONS**

This analysis is subject to the limitations of administrative claims data, including coding errors and coding omissions. The data capture only episodes and diseases for which health services are utilized and for which a diagnosis is made or a medication prescribed. Further, the population represented in the above analysis is the privately insured population, a generally healthier population than that of the entire U.S.

This analysis focused only on physical comorbidities associated with bipolar disorder. Other mental health diagnoses — including substance abuse disorders — were not examined, and are not discussed here.

While this analysis presented statistics on various comorbidities of bipolar disorder, more in-depth examination of the subject is warranted.

## CONCLUSIONS

This analysis demonstrated that, in 2006 and 2007, patients with a bipolar diagnosis were at greater risk for a wide range of comorbid conditions. Two types of conditions were noted in particular.

Patients diagnosed with bipolar disorder were 3.13 times more likely than the control group to have a trauma or iatrogenic episode. There is discussion in the literature regarding the association of bipolar disorder and certain types of trauma and iatrogenic episodes (such as craniocerebral injury or lithium toxicity). However, the high overall incidence of trauma and iatrogenic episodes among the bipolar population has received less attention than other types of comorbidities affecting the population.

Bipolar patients were 1.68 times more likely to have an endocrine or metabolic disorder than were patients with no mental health diagnoses. Medications to treat bipolar disorder such as mood stabilizers and antipsychotic medication have been associated with increased risk for endocrine disorders including hypothyroidism, diabetes insipidus, and hyperparathyroidism.<sup>5, 6, 7</sup> Also note that episodes related to thyroid conditions may indicate that the patient has bipolar disorder and thyroid problems, that the patient had a test to rule out thyroid conditions, or that the patient was first diagnosed with bipolar disorder but it was subsequently determined the patient had a thyroid condition instead. Finally, studies have shown bipolar disorder is associated with poor health behaviors such as overeating and smoking.<sup>8, 9</sup> Obesity is an established risk factor for diabetes mellitus and other metabolic disorders.

While medication and behavioral characteristics are known reasons for increased risk of disease among bipolar patients, much is still unknown about the reasons for increased rates of comorbidities among this population and about possible means of reducing them.

Existing research points to the importance of raising provider awareness of diseases for which bipolar patients are at highest risk, of considering the advantages and disadvantages of particular treatments in light of the risks each particular patient faces, and of more closely monitoring the health of these patients.<sup>3, 4, 10</sup> Studies have shown that care delivery systems in which coordination and continuity of care are central components can improve the health of bipolar patients by lessening the duration of manic episodes and improving aspects of quality of life.<sup>11, 12</sup> Our analysis underscores the urgent need for further exploration of how to best increase providers' capacity to address, monitor, and, ultimately, improve the psychiatric and physical health of bipolar patients.

## SUGGESTED CITATION

Stranges EM, Houchens RL, Mark TL, Coffey RM, Wang SS, Marder WD, Kassed CA. Patients with bipolar disorder at higher risk for wide range of physical comorbidities. Thomson Reuters, June 2009.

## TO FIND OUT MORE

For more information, please e-mail [medstat.research@thomsonreuters.com](mailto:medstat.research@thomsonreuters.com).

To view the online interactive research on Bipolar Disease and Physical Comorbidities, please visit the following Web site: <http://research.thomsonhealthcare.com/treemaps/>. The site includes links to interactive versions of the tree maps used to produce this research brief. The tree maps feature detail on the incidence of disease and the relative risk of disease for bipolar patients.

## SUBSCRIPTION INFORMATION

We invite you to subscribe to this report series by submitting your contact information online at <http://research.thomsonhealthcare.com/statbriefs>. Reports are distributed in electronic format at no charge.

## REFERENCES

- <sup>1</sup>Bipolar Disorder. National Institute of Mental Health. April 21, 2009. <http://www.nimh.nih.gov/health/publications/bipolar-disorder/>
- <sup>2</sup>Kessler RC, Chiu WT, Demler O, Merikangas KR, Walters EE. Prevalence, severity, and comorbidity of twelve-month DSM-IV disorders in the National Comorbidity Survey Replication (NCS-R). *Archives of General Psychiatry*. 62:6, 617-627, 2005.
- <sup>3</sup>Carney CP, Jones LE. Medical comorbidity in women and men with bipolar disorders: A population-based controlled study. *Psychosomatic Medicine*. 68:5, 684-91, September-October 2006.
- <sup>4</sup>Krishnan KR. Psychiatric and medical comorbidities of bipolar disorder. *Psychosomatic Medicine*. 67:1, 1-8, January-February 2005.
- <sup>5</sup>Fagiolini A, Kupfer DJ, Scott J, Swartz HA, Cook D, Novick DM, Frank E. Hypothyroidism in patients with bipolar I disorder treated primarily with lithium. *Epidemiologia e Psichiatria Sociale*. 15: 2, 123-7, April-June 2006.
- <sup>6</sup>Bedford JJ, Weggery S, Ellis G, McDonald FJ, Joyce PR, Leader JP, Walker RJ. Lithium-induced nephrogenic diabetes insipidus: Renal effects of amiloride. *Clinical Journal of the American Society of Nephrology*. 3:5, 1324-31, September 2008, Epub July 2, 2008.
- <sup>7</sup>Hundley JC, Woodrum DT, Saunders BD, Doherty GM, Gauger PG. Revisiting lithium-associated hyperparathyroidism in the era of intraoperative parathyroid hormone monitoring. *Surgery*. 138:6, 1027-31, December 2005.
- <sup>8</sup>Wildes JE, Marcus MD, Fagiolini A. Prevalence and correlates of eating disorder co-morbidity in patients with bipolar disorder. *Psychiatry Research*. 161:1, 51-8. October 30, 2008, Epub September 7, 2008.
- <sup>9</sup>Diaz FJ, James D, Botts S, Maw L, Susce MT, de Leon J. Tobacco smoking behaviors in bipolar disorder: A comparison of the general population, schizophrenia, and major depression. *Bipolar Disorders*. 11:2, 154-65, March 2009.
- <sup>10</sup>Kupfer DJ. The increasing medical burden in bipolar disorder. *Journal of the American Medical Association*. 293:20, 2528-30, May 25, 2005.
- <sup>11</sup>Bauer MS, McBride L, Williford WO, Glick H, Kinosian B, Altshuler L, Beresford T, Kilbourne AM, Sajatovic M; Cooperative Studies Program 430 Study Team. Collaborative care for bipolar disorder: Part II. Impact on clinical outcome, function, and costs. *Psychiatric Services*. 57:7, 937-45, July 2006.
- <sup>12</sup>Williams JW Jr, Manning JS. Collaborative mental health and primary care for bipolar disorder. *Journal of Psychiatric Practice*. 14 Suppl 2:55-64, May 2008.

## ABOUT THOMSON REUTERS

The Healthcare business of Thomson Reuters produces insights, information, benchmarks and analysis that enable organizations to manage costs, improve performance, and enhance the quality of healthcare. Thomson Reuters is the world's leading source of intelligent information for businesses and professionals. We combine industry expertise with innovative technology to deliver critical information to leading decision makers in the financial, legal, tax and accounting, scientific, healthcare and media markets, powered by the world's most trusted news organization. With headquarters in New York and major operations in London and Eagan, Minn., Thomson Reuters employs more than 50,000 people in 93 countries. Thomson Reuters shares are listed on the New York Stock Exchange (NYSE: TRI); Toronto Stock Exchange (TSX: TRI); London Stock Exchange (LSE: TRIL); and Nasdaq (NASDAQ: TRIN).

[healthcare.thomsonreuters.com/research](http://healthcare.thomsonreuters.com/research)

Thomson Reuters  
777 E. Eisenhower Parkway  
Ann Arbor, MI 48108 USA  
Phone +1 734 913 3000

©2009 Thomson Reuters.  
All rights reserved.  
PAY-6768 0609 MC



THOMSON REUTERS™