

# THE HIGH COST OF MENTAL DISORDERS

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## FACTS FOR EMPLOYERS

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## From the co-founders of the One Mind Initiative at Work:

Misconceptions about mental health persist in our country, and one of them is that mental illnesses—especially depression—are not a concern for leaders of public, private, and non-profit organizations. Yet, the impact of these conditions on organizations of all sizes is significant and affects the health, wealth, and success of employees and employers alike. A shift in perspective, an expansion of awareness, and increased support for employees impacted by mental illness can improve the lives of millions and drive economic growth. Depression is much more common than our society would have us believe; it affects all organizations, without exception. Until we are willing to recognize its ill effects, not only for individuals and families, but also for organizations, we will continue to lose opportunities, productivity, and performance.

Most employers know that mental health conditions and addictions affect workforce productivity. What most don't know is that these illnesses—beyond causing unnecessary human suffering—are responsible for driving costs and decreasing organizational performance. It is no exaggeration to say that the current workplace landscape, wherein mental disorders go unrecognized and untreated, is operating at a fraction of its full potential. Imagine what could happen in a world in which mental health is as important as physical health—a world in which employees receive the care they need and, consequently, perform optimally every day.

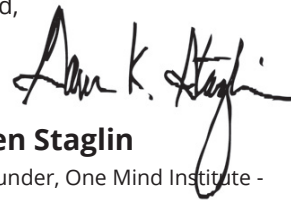
Together, through the One Mind Initiative at Work, we are building a global coalition of leading employers who are working across sectors and industries to transform workplace approaches to productivity and engagement, through brain fitness and mental health.

We believe that now is the time for a private sector response commensurate with the size of the issue. A

committed group of corporate and other leaders can transform the workplace into an environment where people thrive, where productivity and engagement increase, and where health risks—both physical and mental—are greatly reduced.

One Mind Initiative at Work is proud to partner with Tufts Medical Center Institute for Clinical Research and Health Policy Studies (ICRHPS) and Professor Debra Lerner, founder and director of the Program on Health, Work and Productivity, to provide you with the following analysis. It is our hope that the information elucidates just how profoundly mental health affects your organization from the ground up by allowing you to quantify the cost of mental health challenges within your workforce. More importantly, the report contains the tools necessary to build an airtight case for the improvement of mental health coverage. You will understand the direct connection between brain health and workforce productivity, medical costs, and business costs—and you will be at the forefront of a paradigm shift in the employer landscape. We look forward to witnessing organizations operating at the next level, driven by your leadership and insight.

Signed,



**Garen Staglin**

Co-Founder, One Mind Institute -  
A Founding Organization of the One Mind Initiative



**The Hon. Patrick J. Kennedy**

Founder, The Kennedy Forum -  
A Founding Organization of the One Mind Initiative

## Preface

Seventeen years ago—long before joining the Sutter Health team—I was one of the employees represented by much of the data in this report, with undiagnosed, untreated, and undertreated major depression. Even with treatment, I struggled. Over two years, my performance and functioning declined drastically. I missed many days of work, had several extended sick leaves, high prescription drug costs, disruptive behaviors, lack of support at work, and resulting significant loss of productivity. My world was falling apart—I was losing my family, my identity as a competent employee, my sense of connection to my work and to my colleagues, my self-concept of being a smart person, a good person... I almost lost my life to suicide inside the nightmare of trying to figure out what was happening to me and how to get help in a fragmented, fractured, unfair and unsupportive set of systems, processes and attitudes.

I am lucky that I had the internal and external resources to make a career change, and found myself in the emerging field of workplace mental health. Back then, employers said: “We don’t need information on how to support employees with mental health challenges—none of ‘those’ people work here.” Fortunately, in the ensuing years, that attitude has begun to shift.

This report lays to rest any misinformed idea that mental health issues do not affect employees in every workplace, and definitively and comprehensively solidifies the fact that employers who wish to stay competitive must address the complexity of factors related to employee mental health. My hope is that, with this issue of cost now firmly and finally settled, employers will commit to addressing employee mental health, and force policy, funding and service system transformation. They can connect to deeper, broader, and more evolved values than just the dollar value of their employees. Employers can connect to passion and compassion for their workforce, to the consideration of the bigger public health imperative of building

psychologically healthy and safe workplaces where people are valued and times of struggle are handled in seamless and supportive stride.

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***We are on our way there with the partnership of the One Mind Initiative at Work, Sutter Health and the Steinberg Institute. Together, we aim to accelerate our organizations’ efforts to transform employer-based approaches to mental health. With the release of this report, and our continued collaboration, I am pleased to say that we are finally on our way there.***

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**Donna Hardaker,**

Workplace Mental Health Leader,  
Sutter Health

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## ABSTRACT/ EXECUTIVE SUMMARY

While the enormous national and global cost of mental illness and substance abuse has been reported extensively, it has been hard for employers to determine the precise human and economic impact of these disorders within their own companies. The available information - usually medical and pharmacy claims - includes only a fraction of actual workplace costs. However, as a result of new, high quality research, employers will be able to more easily and accurately assess the situation within their own companies. This report provides the necessary numbers and tools.

As this report will show, businesses incur several different types of costs. These include the direct costs under benefits plans for treating mental illnesses such as depression or anxiety as well as the extra costs of treating co-occurring (comorbid) conditions such as diabetes. They also include the so-called indirect or productivity costs. These costs, which are due to absenteeism, presenteeism, job turnover, work disability and premature death, represent the largest share of the full cost of mental disorders. They include both the costs for employees afflicted with mental disorders and the costs for employees serving as informal, unpaid caregivers of family members and friends who are ill.

The bottom line is that for many, if not most, employers, the single most expensive category of health problems in their companies is not heart disease, cancer, or musculoskeletal illness, but mental disorders. Many will find their costs to be staggering, even though this report's cost assessment methodology is conservative - describing the costs of only one mental disorder, serious depression - for which there is research on prevalence and expenditures. Nevertheless, this one condition costs many businesses millions of dollars annually, while the cost to American employers collectively soars into the billions.

This report also makes three important observations. First, mental disorders are surprisingly prevalent across all occupations meaning that mental disorders are relevant to employers regardless of industry and company size. Second, many employees are not seeking treatment while those who do often fail to receive the best care available - leading to continuing and unnecessary costs related to treatment and lost productivity as well as human suffering. This is the legacy of stigma and lack of resources that historically have surrounded mental illness. Third, there is a growing awareness that mental and medical (i.e. physical) illnesses frequently co-occur, making care of the physical illnesses more difficult and resulting in poorer outcomes and greater costs. Together, these observations underscore the importance of making mental health care a mainstream part of an employer's health strategy.

Addressing the enormous toll that mental disorders are taking in the workplace, this report uses sources that have been curated specifically for employers. It provides both a reference table that lists all of the cost components necessary to compute the full cost of major depression as well as a link to our website, which will provide an interactive cost calculator for computing company-specific costs. The approach in this paper and accompanying cost calculator are highly conservative, given that we address only one mental health condition - major depression.

## INTRODUCTION

Following decades of considering company health care expenditures as a liability, many business leaders now recognize that employee health contributes to business success. Sustaining employee health is an opportunity – an investment worth making and not simply a cost to be avoided. Increasingly employee health is seen as means to improving business performance, paying dividends to the bottom line, employee engagement, well-being and individual quality of life.

Businesses nationally have been increasing the scope of their employee health services and resources, giving particular attention to costly health problems like heart disease, cancer, and musculoskeletal conditions, and related risk factors for costly conditions like obesity, tobacco smoking, sedentary lifestyle and stress. Yet, when both health care and productivity costs are tallied, mental disorders represent the single most expensive category of health problems to business. Mental disorders include common conditions such as depression and anxiety as well as alcohol misuse and substance abuse.

The level of priority and investment given to mental disorders in the workplace has not been on par with the degree of attention placed on physical health problems. Paradoxically, this is happening despite significant treatment advances, growth in the demand for workers with high-level cognitive and interpersonal capabilities and research documenting the huge cost of mental disorders to society.<sup>1</sup> In business matters, employers simply would not tolerate the current situation for managing depression and other mental disorders- the wasted money, poor results and lack of access to needed, effective resources.

Annually in the U.S., an estimated \$87.5 billion is spent on health care for mental disorders while another \$44 billion is spent on lost work productivity due to depression alone.<sup>2</sup> Driven by their frequent occurrence and co-occurrence with other health problems, mental disorders are, at a population level, among the most costly illnesses (Figure 1).<sup>3</sup> For privately insured individuals, many of whom have employer-sponsored coverage, mental disorders rank fifth in total health care expenditures among women and seventh among men. Within the nation's top 5% of its costliest patients, the group with mental disorders is second highest in total expenditures (Figure 2).<sup>4</sup>

Despite having high total health care expenditures (these are the costs of care for all health problems incurred by adults with mental disorders), it is incorrect to conclude that people with mental disorders are getting the care they need. In fact, many adults with mental disorders have trouble accessing high quality care (Figure 3).<sup>5</sup> In a recent national study, 8.4% of U.S. adults had positive depression screening results but most (71%) did not receive any treatment. Of those receiving any depression treatment, the quality of the care received was questionable; 30% of the treated were still depressed and 78% were experiencing serious mental distress.<sup>6</sup> Such statistics, depicting the troubled state of care, are reminiscent of the situation patients with heart disease faced decades ago.

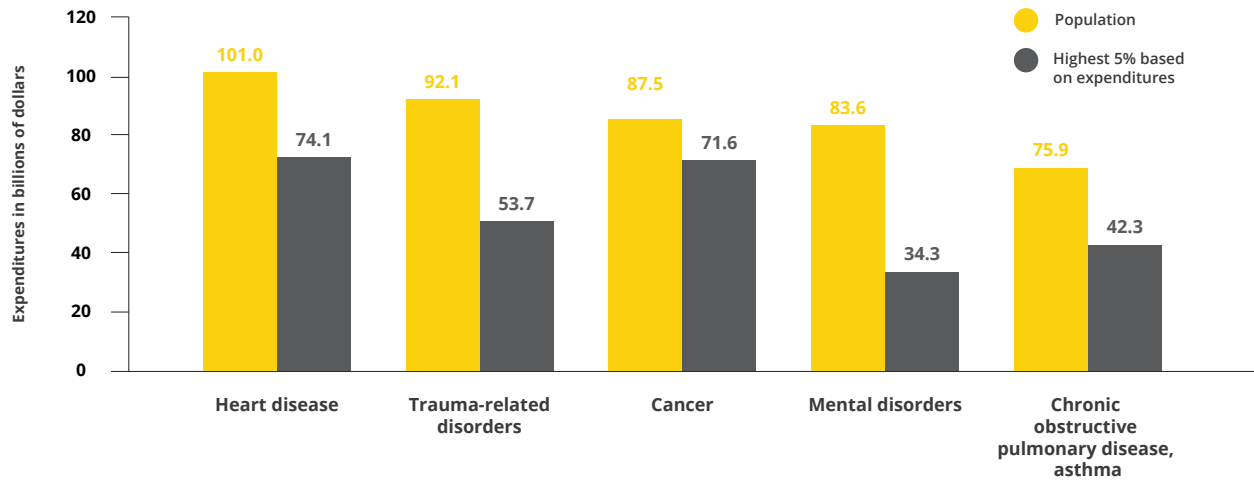
**Figure 1. Ten most costly conditions among U.S. adults age 18 and older with any private insurance, 2014**

Conditions	Rank among women	Expenditure for women (billions)	Standard error	Population for women (millions)	Rank among men	Expenditure for men (billions)	Standard error	Population for men (millions)
Trauma-related disorders	1	30.1	4.04	10.4	2	34.2	6.85	10.5
Osteoarthritis and other non-traumatic joint disorders	2	30.1	3.45	14.8	6	17.4	2.73	9.9
Cancer	3	26.9	5.24	6.4	3	33.1	5.69	5.5
Diabetes mellitus	4	20.5	2.56	7.0	4	23.1	2.58	7.8
Mental disorders	5	20.2	1.64	17.3	7	16.5	3.31	10.4
Heart disease	6	20.1	3.03	6.3	1	39.5	6.01	7.3
Back problems	7	19.6	3.58	9.2	10	11.1	1.71	6.9
Chronic obstructive pulmonary disease, asthma	8	17.5	2.24	14.2	5	18.7	3.12	9.7
Infectious diseases	9	16.2	9.30	6.0	18	9.2	2.15	3.9
Systemic lupus and connective tissues disorders	10	15.0	1.95	8.7	11	10.9	2.15	4.5
Hypertension	12	11.8	0.96	18.4	8	15.0	2.74	20.3
Hyperlipidemia	15	8.9	0.67	13.5	9	13.9	1.38	16.9

Updated with 2014 data and adapted from – Soni, A. (2011). Top 10 most costly conditions among men and women, 2008: Estimates for the US civilian noninstitutionalized adult population, age 18 and older. Agency for Healthcare Research and Quality.

**See Technical Note 1.**

**Figure 2. Total expenditures for the five most costly conditions among the overall U.S. population and among the highest 5% based on their overall medical expenditures, 2012**



Adapted from Cohen, S. B. (2014). The concentration of health care expenditures and related expenses for costly medical conditions, 2012. Agency for Healthcare Research and Quality.

See Technical Note 2.

**Figure 3. Percentage of those aged 12 and over who contacted a mental health professional in past 12 months, by depressive symptom severity: U.S., 2009-2012.**

	Depressive symptom severity	Percent who contacted mental health professional	Standard error
All persons	No symptoms	5.2	0.4
	Mild	13.0	1.2
	Moderate	19.6	2.3
	Severe	35.3	3.7

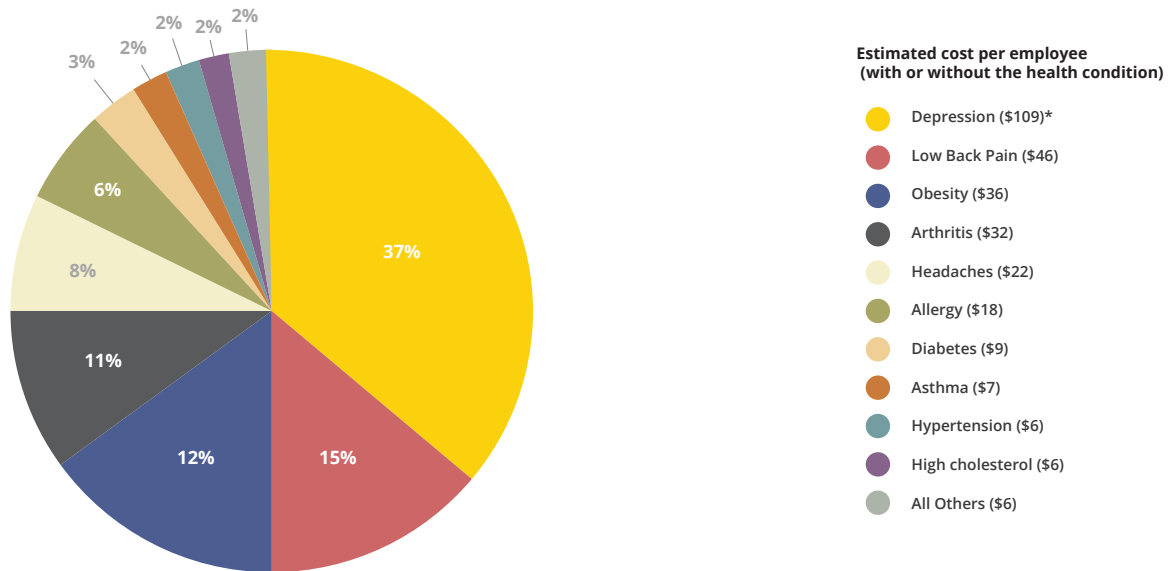
Data source: National health and Nutrition Examination Survey (NHANES), a survey conducted by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS)

See Technical Note 3.

While health care expenditures for mental disorders represent a large financial burden on employers, they pale in comparison to other bottom line costs. Take, for example, the costs associated with major depressive disorder (also known as “major depression”). Several studies have found that, in comparison to a wide range of illnesses of all types, major depression ranks among the leading sources of health-related productivity loss.<sup>7,8</sup> One analysis of more than three million employee health assessment surveys identified depression as the most expensive category of presenteeism-productivity loss occurring while employees are working (Figure 4). As many employers know well, the amount of lost work time and lost productivity only multiplies when the secondary impact of illness on others at work and at home (including employed family members) are taken into account.



**Figure 4. Productivity loss due to presenteeism: top 10 most expensive chronic conditions based on health risk assessment data\***



\*Costs per employee and percentages are based on an assumed annual salary of \$50,000.

Data source: This data comes from seven different web-based health risk assessments conducted between 2003 and 2011.

See Technical Note 4.

## The Workplace Costs of Mental Disorders Have Been Underestimated

At this point, readers may be wondering how much mental disorders are costing their own organizations. One of the reasons for this report is that determining these costs is not easy and, generally speaking, they are underestimated. These are some of the reasons why:

- Many employers use medical and pharmacy claims reports to monitor and manage their health care expenditures though, for decades, mental disorders have been underreported. Underreporting in claims occurs because of gaps in employee insurance coverage, provider behavior, employee difficulty accessing mental health care and other factors.
- Employers, like others, often assume that only serious mental illnesses such as schizophrenia have an impact on ability to work and that these rarely make an appearance in the workplace. Yet, conditions such as major depression, anxiety, alcohol misuse and drug abuse are common among employed adults and impact work.
- The stigma associated with mental illness has discouraged many employees from seeking help or disclosing an illness. Stigma also deters some employers from taking steps to screen for mental disorders and encourage care-seeking.

Since the landmark publication of the Surgeon General's Report on Mental Illness in America (1999), a variety of initiatives have been undertaken aimed at reducing stigma and increasing care access, availability and quality.<sup>9</sup> While businesses continue to bear a substantial portion of the costs of mental disorders, current scientific knowledge and best practices can reduce their human and economic

burdens. Employers have an important leadership role in changing how mental disorders are dealt with within their own companies, their neighboring communities and nationally.

## A Major Cost Driver: Mental Disorders are Prevalent Among Employees in all Types of Work and at all Occupational Levels

At the heart of the cost issue is the relatively high rate at which mental disorders occur in the employed population irrespective of gender, age, race/ethnicity, occupation or industry. The large number of employed adults who experience mental disorders at least once means that it is nearly impossible for companies to avoid their impact entirely.

An important statistic for employers to have when computing their costs is the mental disorder prevalence rate. Prevalence rates are important because they are directly related to the total cost of mental disorders. Prevalence rates reflect the number of persons with new (incident) and ongoing illness as a proportion of all persons in a designated population (such as employees) within a specific time period (e.g., lifetime, the prior 12-months or currently in the past two weeks). Companies often do not have information about the prevalence of mental disorders within their employee and dependent populations unless they have succeeded in implementing company-wide screening initiatives. Fortunately, estimates based on national surveys have the answers.

**Figure 5. Twelve-month prevalence estimates for mental disorders by diagnostic category—results from the National Comorbidity Survey-Replication (NCS-R)**

12-Month	Total		Sex				Cohort							
			Female		Male		18-29		30-44		45-59		60+	
	%	Standard error	%	Standard error	%	Standard error	%	Standard error	%	Standard error	%	Standard error	%	Standard error
<b>I. Anxiety disorders</b>														
Panic disorder	2.7	(0.2)	3.8	(0.3)	1.6	(0.2)	2.8	(0.4)	3.7	(0.5)	3.1	(0.4)	0.8	(0.2)
Agoraphobia without panic <sup>7</sup>	0.9	(0.1)	0.9	(0.2)	0.8	(0.2)	1.0	(0.2)	0.8	(0.2)	1.2	(0.3)	0.4	(0.1)
Specific Phobia	9.1	(0.4)	12.2	(0.5)	5.8	(0.5)	10.3	(0.8)	9.7	(0.6)	10.3	(0.9)	5.6	(0.5)
Social Phobia	7.1	(0.3)	8.0	(0.5)	6.1	(0.5)	9.1	(0.7)	8.7	(0.7)	6.8	(0.6)	3.1	(0.3)
Generalized anxiety disorder <sup>7</sup>	2.7	(0.2)	3.4	(0.2)	1.9	(0.3)	2.0	(0.3)	3.5	(0.3)	3.4	(0.3)	1.5	(0.3)
Post-traumatic stress disorder <sup>2</sup>	3.6	(0.3)	5.2	(0.4)	1.8	(0.3)	4.0	(0.5)	3.5	(0.5)	5.3	(0.6)	1.0	(0.2)
Obsessive-compulsive disorder <sup>3</sup>	1.2	(0.3)	1.8	(0.5)	0.5	(0.2)	1.5	(0.4)	1.4	(0.6)	1.1	(0.6)	0.5	(0.3)
Adult separation anxiety disorder <sup>2</sup>	1.9	(0.2)	2.1	(0.2)	1.7	(0.3)	4.0	(0.5)	2.2	(0.3)	1.3	(0.3)	0.1	(0.1)
Any anxiety disorder <sup>2</sup>	19.1	(0.7)	23.4	(0.8)	14.3	(0.8)	22.3	(1.0)	22.7	(1.0)	20.6	(1.3)	9.0	(1.8)
<b>II. Mood disorders</b>														
Major depressive disorder <sup>7</sup>	6.8	(0.3)	8.6	(0.4)	4.9	(0.4)	8.3	(0.4)	8.4	(0.5)	7.0	(0.7)	2.9	(0.4)
Dysthymia <sup>7</sup>	1.5	(0.1)	1.9	(0.2)	1.0	(0.1)	1.1	(0.2)	1.7	(0.3)	2.3	(0.5)	0.5	(0.2)
Bipolar I-II-sub disorders	2.8	(0.2)	2.8	(0.2)	2.9	(0.3)	4.7	(0.6)	3.5	(0.4)	2.2	(0.3)	0.7	(0.2)
Any mood disorder	9.7	(0.4)	11.6	(0.5)	7.7	(0.6)	12.9	(0.7)	11.9	(0.7)	9.4	(0.7)	3.6	(0.4)
<b>III. Impulse-control disorders</b>														
Oppositional-defiant disorder <sup>4,7</sup>	1.0	(0.2)	1.1	(0.2)	0.9	(0.3)	1.2	(0.3)	0.8	(0.2)	--	--	--	--
Conduct disorder <sup>4</sup>	1.0	(0.2)	0.4	(0.1)	1.7	(0.5)	1.4	(0.3)	0.8	(0.3)	--	--	--	--
Attention-deficit/hyperactivity disorder <sup>4</sup>	4.1	(0.3)	3.9	(0.6)	4.3	(0.5)	3.9	(0.4)	4.2	(0.6)	--	--	--	--
Intermittent explosive disorder <sup>7</sup>	4.1	(0.3)	3.4	(0.4)	4.8	(0.4)	8.3	(0.9)	4.6	(0.4)	2.1	(0.3)	0.9	(0.3)
Any impulse-control disorder <sup>4,6</sup>	10.5	(0.7)	9.3	(1.0)	11.7	(0.8)	11.9	(0.1)	9.2	(0.7)	--	--	--	--
<b>IV. Substance disorders</b>														
Alcohol abuse with/without dependence <sup>2</sup>	3.1	(0.3)	1.8	(0.3)	4.5	(0.4)	7.1	(0.7)	3.3	(0.5)	1.6	(0.3)	0.3	(0.2)
Drug abuse with/without dependence <sup>2</sup>	1.4	(0.2)	0.7	(0.1)	2.2	(0.3)	16.7	(0.5)	1.2	(0.3)	0.4	(0.1)	0.0	(0.0)
Nicotine dependence <sup>2</sup>	11.0	(0.6)	10.5	(0.8)	11.6	(0.7)	11.6	(0.4)	11.2	(1.0)	10.0	(1.1)	5.6	(0.7)
Any substance disorder <sup>2</sup>	13.4	(0.6)	11.6	(0.8)	15.4	(0.9)	22.0	(0.6)	13.8	(1.1)	11.2	(1.2)	5.9	(0.7)
<b>V. Any disorder</b>														

<sup>1</sup> This Table includes updated data as of July 19, 2007. Updates reflects the latest diagnostic, demographic and raw variable informations.

<sup>2</sup> Assessed in the Part II sample (n=5,692).

<sup>3</sup> Assessed in a random one-third of the Part II sample (n=2,073).

<sup>4</sup> Assessed in the the Part II sample among respondents in the age range 18-44 (n=3,197).

<sup>5</sup> Estimated in the Part II sample. Now adjustments is made for the fact that one or more disorders in the category were not assessed Part II respondents.

<sup>6</sup> The estimated prevalence of any impulse-control disorder is larger than the sum of the individual disorders because the prevalence of intermittent explosive disorder, the only impulse-were not assessed (Part II respondents in the age range 18-44). The estimated prevalence of any impulse-control disorder in comparison, is estimated in the latter sub-sample. Intermittent explosive disorder has a considerably higher estimated prevalence in this sub-sample than in the total sample.

<sup>7</sup> Disorder with hierchy

Reproduced from National Comorbidity Survey Replication (2007). 12-month prevalence of DSM-IV/WMH-CIDI disorders by sex and cohort (n=9282). Retrieved from [http://www.hcp.med.harvard.edu/ncs/ftpd/ncsr\\_12monthprevgenderxage.pdf](http://www.hcp.med.harvard.edu/ncs/ftpd/ncsr_12monthprevgenderxage.pdf)

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**See Technical Note 5.**

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Almost one out of every three adults 18 years of age and older, experiences a mental disorder including depression, anxiety and/or substance use every year (Figure 5). For anxiety disorders, the rate is almost one out of five adults while for mood disorders (including depression), the rate is almost one out of ten. For substance abuse disorders the rate is approximately one out of eight adults. These rates generally hold for adults between the age of 30-44 and 45-59 years of age, the age range of most employed Americans, with somewhat higher rates for all disorders among those between 18 and 29 years of age.<sup>10</sup>

Research on exposure to work stress in different occupations has led to speculation about the degree to which certain groups of employees may be more (or less) vulnerable to developing mental disorders. Differences in the rates at which certain groups of employees experience mental disorders could have important implications for employers when determining total costs.

Currently, epidemiological research in the U.S. has not found strong support for occupational group differences in the prevalence of major depression.<sup>11</sup> A large study conducted in the United Kingdom (UK)<sup>12</sup> had similar results - finding few meaningful occupational differences in the prevalence of multiple common mental disorders (i.e. depressive episodes and disorders; neurotic, stress-related and somatoform disorders; and phobias). The conclusion to be drawn from these studies is that mental disorders affect all employee groups (Figure 6).

**Figure 6. Rates of current common mental disorders (CMD) among employed adults in the United Kingdom by occupation**

	Sample n(%)	With CMD n(%)
<b>Major SOC groups</b>		
<b>Males and females</b>		
Managers and senior officials	558 (16.3)	63 (11.3)
Professional occupations	450 (13.1)	53 (11.7)
Associate professional and technical occupations	560 (16.4)	82 (14.7)
Administrative and secretarial occupations	372 (10.9)	57 (15.4)
Skilled trades occupations	312 (9.1)	31 (9.8)
Personal service occupations	282 (8.2)	67 (23.9) *
Sales and customer service occupation	273 (8.0)	47 (17.4)
Process, plant and machine operatives	243 (7.1)	18 (7.5) *
Elementary occupations	374 (10.9)	63 (16.8)
Total	3425	482 (14.1)
<b>Males</b>		
Managers and senior officials	354 (19.3)	28 (7.9)
Professional occupations	265 (14.4)	27 (10.2)
Associate professional and technical occupations	265 (14.4)	30 (11.2)
Administrative and secretarial occupations	97 (5.3)	15 (15.9)
Skilled trades occupations	289 (15.7)	23 (7.8)
Personal service occupations	57 (3.1)	10 (18.3)
Sales and customer service occupation	94 (5.1)	15 (15.9)
Process, plant and machine operatives	207 (11.3)	12 (5.6) *
Elementary occupations	209 (11.4)	24 (11.3)
Total	1834	183 (10.0)
<b>Females</b>		
Managers and senior officials	204 (12.8)	35 (17.3)
Professional occupations	186 (11.7)	26 (13.8)
Associate professional and technical occupations	295 (18.6)	53 (17.9)
Administrative and secretarial occupations	275 (17.3)	42 (15.2)
Skilled trades occupations	23 (1.5)	8 (34.3)
Personal service occupations	226 (14.2)	57 (25.3) *
Sales and customer service occupation	179 (11.2)	33 (18.2)
Process, plant and machine operatives	36 (2.3)	7 (18.5)
Elementary occupations	165 (10.4)	126 (23.8)

\*Process, plant, and machine operatives have significantly lower odds of having a CMD.

\*Personal service occupations have significantly higher odds of having a CMD.

Adapted from Stansfeld, S.A., Pike, C., McManus, S., Harris, J., Bebbington, P., Brugha, T., & Clark, C. (2013). Occupations, work characteristics and common mental disorder. *Psychological medicine*, 43(05), 961-973.

**See Technical Note 6.**

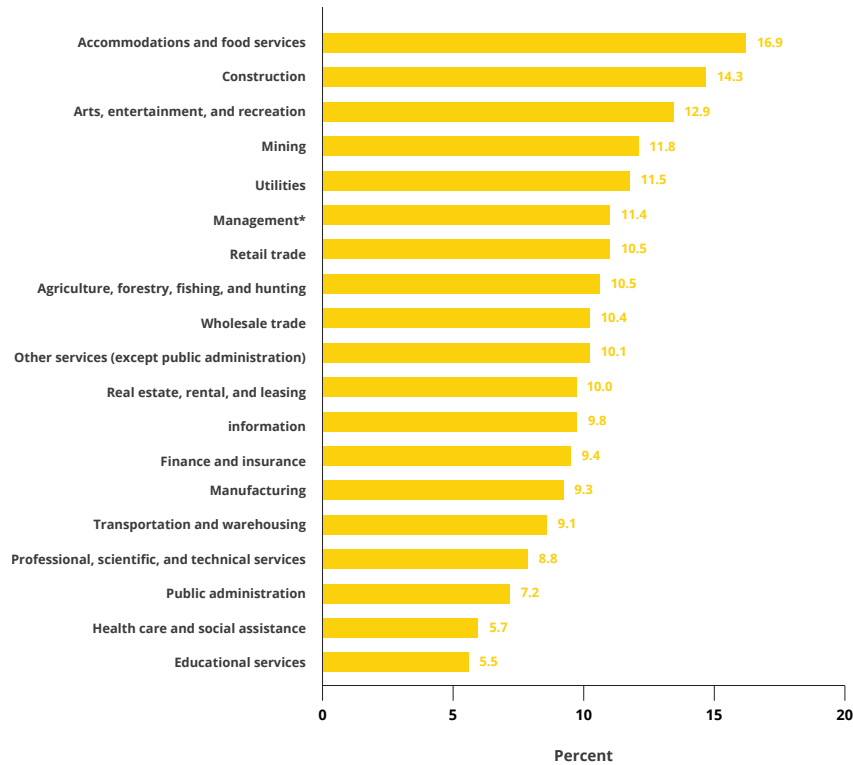
However, studies have found evidence to suggest that rates of certain mental disorders vary according to the type of industry in which people are employed. This conclusion applies to rates of heavy drinking and illicit drug use, both of which generate large human and economic costs.

A national survey of full-time U.S. employees (18 to 64 years of age) found that 8.7% used alcohol heavily in the past month, 8.6% used illicit drugs in the past month; 9.5% were dependent on or abused alcohol and/or illicit drugs in the past twelve months.<sup>13, 14</sup>

Heavy alcohol use rates in the highest use industries (mining, construction and accommodations and food services) were approximately 300% more than the lowest use industries (public administration, educational services and health care and social assistance). Substance use disorders in the highest use

industries (accommodations and food services, construction and arts, entertainment and recreation) were also approximately 300% more than the three lowest use industries (public administration, health care and social assistance and educational services). Safety-sensitive industries such as construction and mining ranked in the top five on both. Figure 7 summarizes industry rates for the combined use of alcohol and illicit drugs.

**Figure 7. Alcohol misuse and illicit drugs use in the past 30 days among U.S. employees by industry**



\* The full title of this category is "Management of companies and enterprises, administration, support, waste management, and remediation services."

Source: SAMHSA, Center for Behavioral Health Statistics and Quality, National Surveys on Drug Use and Health (NSDUHs) 2008 to 2010 (revised March 2012) and 2011 to 2012.

**See Technical Note 7.**

Looking just at depression alone, the shocking conclusion based on reliable prevalence data is that for a business with 10,000 employees, and a male/female ratio of 45%/55%, nearly 1,000 employees are likely suffering from depression.

## Productivity Costs are Substantial and Related to Multiple Workplace Impacts

Once disease prevalence has been established, the next step to determining the total cost is to apply the relevant per-employee costs. These include the costs of health care and productivity loss as well as the costs associated with co-occurring conditions.

The negative effects of unrecognized, untreated or inappropriately treated mental disorders on business performance are indisputable.<sup>15-17</sup> The symptoms of mental disorders and related functional limitations interfere to varying degrees with performing work effectively and efficiently. Depending upon the severity of the symptoms and functional limitations, their duration and their frequency of occurrence, employees with mental disorders may experience mild, moderate or severe difficulty working, lasting temporarily or permanently.

Productivity losses occur when employees spend less time on the job (work absences), perform sub-optimally while working (presenteeism) or injure themselves or others while working. Costs are also incurred from turnover (voluntarily or involuntarily leaving a job or employer), work disability and premature death. Also pertinent are the costs for the significant portion of employees who are the informal caregivers of family members or friends with mental disorders.

## **A. Missed Work Time Due to Absences**

Mental disorders have been linked to higher than average rates of lost work time. The strongest evidence is obtained from studies of employees with major depression.

Compared to employees without depression, employees with depression miss more days of work at a level that greatly exceeds the usual, normative amount. The smallest reported differences come from studies of employed adults in U.S. households. In these studies, depression adds six to eight more absence days per year onto the number used by non-depressed employees.<sup>2,18</sup> Considerably larger amounts of extra absence days have been reported in studies involving large employee samples, most of whom were insured through an employer. In such studies, depression was found to result in 26 additional absence days per year over and above the amount for non-depressed employees.<sup>18,19</sup>

What accounts for the different estimates? One answer lies in underlying differences in the mix of professions and employers included in the study samples, which has an influence on the amount of paid leave time available to employees, job flexibility and other factors important to establishing employee absence behavior. Methodological differences between studies also contribute to the variation in absences (e.g., household studies take a single reading of absences and annualize the amount).

Figure 8 reports on the results of a longitudinal study of absences among employees who completed depression screening. The important point is that the average employee in white collar, blue collar or sales and service occupations missed approximately one half day per week due to depression (n.b. a heterogeneous group of employees classified as “other” occupations had significantly more absence days than any of the other groups).<sup>20</sup> In the UK study cited earlier, employed adults with depression and other common mental disorders were absent an average of 19 days annually compared to the average of five absence days for employees without these disorders.<sup>12</sup>

**Figure 8. Average number of absence days and average percentage of productivity lost due to absences\*\*for employed adults due to major depression and/or dysthymia: Results from Work and Health Initiative employee screening 2011-2015**

Conditions	Prevalence rate* (N)	Average number of workdays missed/week	Average percentage of usual work hours missed
<b>Employed men</b>			
White collar (N=3,573)	15.0 (535)	0.5	9.6
Blue collar (N=443)	19.0 ( 84)	0.5	10.1
Sales/service (N=722)	15.5 (112)	0.4	8.2
Other (N=417)	16.5 ( 69)	0.7	14.4
Total N=5,497	17.5 (961)	0.5***	10.0***
<b>Employed women</b>			
White collar (N=6,117)	23.0 (1404)	0.4	8.7
Blue collar (N=148)	30.4 ( 45)	0.5	10.3
Sales/service (N=3,426)	27.5 (942)	0.5	9.4
Other (N=724)	26.1 (189)	0.6	12.9
Total N=10,961	25.5 (2799)	0.5***	9.3***
<b>Total employed</b>			
White collar (N=9,702)	20.0 (1942)	0.5	9.1
Blue collar (N=591)	21.8 (129)	0.5	10.4
Sales/service (N=4,153)	25.4 (1054)	0.5	9.5
Other (N=1,142)	22.7 (259)	0.7	13.2
Total N=16,476	22.8 (3764)	0.5***	9.7***

\*Prevalence of two-week major depressive disorder, dysthymia (a chronic, persistent form of depression) or both. Depression is measured with the PHQ-9. Absences were measured with the WLQ Time Loss Module. Occupation was self-reported based on a checklist of number of occupational groups.

\*\*Test of differences in absences between employees with depression vs. those with no depression found that depression group absences were higher to a statistically significant level compared to absences for non-depressed subjects among men only, women only, and the total group of men and women (p \*insert less than or equal to symbol\* .05 level).

\*\*\*Differences in absences due to depression among the occupational groups are statistically significant; the difference is between the Other Occupational category and each of the other categories (p \*insert less than or equal to symbol\* .05 level).

Data source: Online screening initiative as part of the Work and Health Initiative Study, a randomized clinical trial testing a work-focused intervention for depression, which was sponsored by the National Institute on Aging.

See Technical Note 8.

## B. Impaired Work Performance (Presenteeism)

Many employees with mental disorders attend work but experience limitations in ability to perform their work. By any measure, the resulting productivity loss (known as “presenteeism”) is large.

Evidence for the high costs of presenteeism for depression is extensive. Figure 9 illustrates the amount of time employees spent working with limitations due to depression and their related at-work productivity losses. The average amount of time employees spent with impaired work performance was between 13% to 29% of time in a two-week period, depending on the nature of the work tasks performed.

What is not yet widely appreciated about the workplace impact of depression is that it has negative effects on multiple dimensions of performance. Employees with depression experience limitations in their time management abilities (e.g., working at the required pace throughout the workday), as well as their abilities to perform physical work tasks (e.g., lifting, maintaining a stationary position), mental work tasks (e.g., concentrating on work and working carefully), interpersonal work tasks (e.g., communicating with others) and output tasks (e.g., finishing work on time and managing the workload).<sup>21</sup>

Both the severity of the limitations and their pervasive adverse effects on multiple dimensions of performance translate into at-work productivity loss. For employees with depression, lost work productivity is estimated to be in 6% to 7% range. It is considerably higher, in the range of 8% to 11%, for employees with moderate to severe symptoms of major depression.

**Figure 9. Average percentage of time spent working with limitations in performance and average at-work productivity loss for employed adults due to major depression or dysthymia: Results from Work and Health Initiative employee screening 2011-2015\*\***

	Prevalence rate* (N)	Time management limitations	Physical task limitations	Mental-interpersonal task limitations	Output task limitations	Percentage of at-work productivity lost
<b>Employed men</b>						
White collar (N=3,573)	15.0 (535)	30.7	13.8	29.5	28.1	7.2
Blue collar (N=443)	19.0 (84)	33.8	14.6	32.5	24.9	7.4
Sales/services (N=772)	15.5 (112)	31.2	16.1	31.1	25.2	7.2
Other (N=417)	16.5 (69)	27.7	16.2	30.2	19.3	6.3
Total N=5,497	17.5 (961)	31.0	14.7	30.1	26.6***	7.2
<b>Employed women</b>						
White collar (N=6,117)	23.0 (1404)	26.6	12.3	26.5	24.9	6.4
Blue collar (N=148)	30.4 (45)	26.8	8.0	31.5	29.3	7.0
Sales/services (N=3,426)	27.5 (942)	28.3	12.9	28.5	24.4	6.6
Other (N=724)	26.1 (189)	29.1	16.7	31.4	27.9	7.3
Total N=10,961	25.5 (2799)	27.4	12.8	27.7***	24.8	6.5
<b>Total employed</b>						
White collar (N=9,702)	20.0 (1942)	28.1	12.9	27.7	26.1	6.7
Blue collar (N=591)	21.8 (129)	31.7	12.0	32.4	26.4	7.3
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Other (N=1,142)	22.7 (259)	29.5	16.6	31.5	25.6	7.1
Total N=16,476	22.8 (3764)	28.6	13.4	28.6***	25.5	6.7

\*Prevalence of two-week major depressive disorder, dysthymia (a chronic, persistent form of depression) or both. Depression is measured with the PHQ-9. Presenteeism is measured with the Work Limitations Questionnaire (WLQ). Occupation was self-reported based on a checklist of # occupational groups.

\*\*Tests comparing employees with depression vs. those with no depression found statistically significant differences among men only, women only, and the total group of men and women (p \*insert less than or equal to symbol\* .05 level).

\*\*\*Differences in presenteeism among occupational groups for depressed employees are only statistically significant at the p \*insert less than or equal to symbol\* .05 level; the difference is between the Other Occupational category and each of the other categories.

Data source: Online screening initiative as part of the Work and Health Initiative Study, a randomized clinical trial testing a work-focused intervention for depression, which was sponsored by the National Institute on Aging.

See Technical Note 9.

## C. Job Turnover, Work Disability, and Death

The total workplace cost of mental disorders is also related to losing a valued worker. Sometimes the aggregate number of employees lost is less important than the loss of a specific person. In any case, the human and economic cost can be substantial.

One way to express the economic loss is in terms of replacement costs. According to 2010 study of California businesses, on average it costs approximately \$4,000 to replace each employee (\$2,000



for blue collar and manual labor workers and as high as \$7,000 for professional and managerial employees). The average ratio of the average replacement costs per recruit to the average annual wage among all employees is 0.09.<sup>22</sup>

**Turnover**

The percentage of an organization’s personnel who leave during a specific time period is known as the “churn” rate. In labor market research, churning is the sum of employment “separations,” which encompass quits, layoffs and discharges, retirements, transfers to other locations, deaths and separations due to disability.<sup>23</sup> Industry rates are approximately 4% overall for U.S. establishments extending to approximately 6% for high turnover industries such as retail trade. High churn rates are costly to a business.

Presently, there is no single source of information quantifying the churn rate at the individual company level due to mental disorders. However, research has found that employees with mental disorders are vulnerable to higher than average churn events.<sup>24, 25, 26</sup> Not well established is the portion of employment transitions among employees with depression that are voluntary or involuntary.

Evidence regarding excess rates of certain churn events is documented in a study of employed adults with major depression and/or dysthymia (a chronic, persistent form of depression), which excluded anyone planning to leave the labor market within two years (Figure 10).<sup>24</sup> This study was conducted in Massachusetts during a period of economic downturn. Within six months after enrolling, the employment rate in the major depression group was down from 100% to 88%. In the control group of healthy employees, the rate declined to 98% and among employees with rheumatoid arthritis, a chronic physically impairing condition, it was 97%. In summary, there was roughly a 10% difference in the job loss rate among employees with depression compared to other healthy and chronically ill employees.

**Figure 10. Job loss among employees with major depression and/or dysthymia compared to those with rheumatoid arthritis and healthy employees**

Employment at the six-month follow-up among 489 participants in a study of work outcomes of employees with depression by conditions<sup>a</sup>

	Dysthymia (N=59)		Major depression (N=85)		Both dysthymia and major depression (N=85)		Rheumatoid arthritis (N=87)		Control (N=173)		P
	N	%	N	%	N	%	N	%	N	%	
Currently unemployed (N=38)	8	14	10	12	13	15	3	3	4	2	<.001
Currently employed (N=451)	51	86	75	88	72	85	84	97	169	98	<.001

The analyses adjusted for baseline age, gender, and number of comorbid medical conditions.

Adapted from Lerner, D., Adler, D. A., Chang, H., Lapitsky, L., Hood, M. Y., Perissinotto, C., & Rogers, W. H. (2004). Unemployment, job retention, and productivity loss among employees with depression. *Psychiatric Services*, 55 (12), 1371-1378.

**See Technical Note 10.**

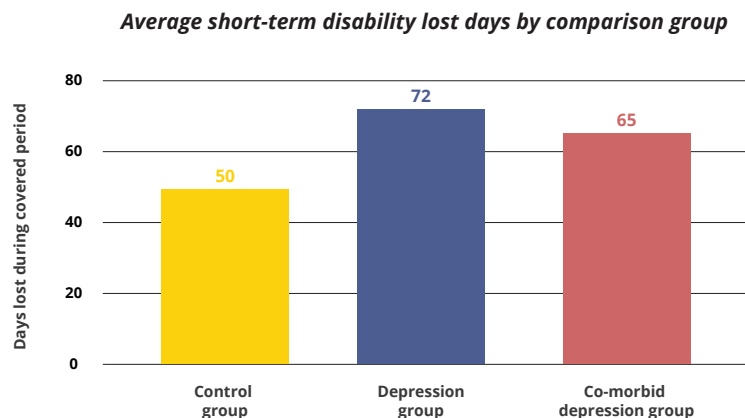
Another large study of employees also found an employment disadvantage due to depression. Employees with depression at baseline had a 20% significantly higher odds of becoming unemployed two years later compared to employees without depression (odds ratio 1.19).<sup>26</sup>

## Disability

The cost of mental disorders is also partly related to lost work time due to work disability and/or work injury. Allocating costs to employers is complicated by the different types of coverage and payment mechanisms in place.

A study of a large multi-employer claims database found that short-term disability claims involving a primary diagnosis of depression resulted in an average of 72 covered absence days compared to 50 covered absence days for claimants without depression. Employee disability claimants with depression that was not the primary diagnosis were absent an average of 65 absence days (Figure 11). The annual prevalence of claims for depression was 2/1,000 covered lives.<sup>8, 27</sup>

**Figure 11. Short-term disability days due to depression**



Source: Ingenix short-term disability claims data; Adapted from *The Full Costs of Depression in the Workforce*, Research by the Integrated Benefits Institute (2009) <https://ibiweb.org/research-resources/detail/the-full-costs-of-depression-in-the-workforce>

**See Technical Note 11.**

Some employees are covered under long-term disability insurance policies. For individuals who are on a paid long-term disability leave, employers may bear all or part of the risk in the form of premiums and/or benefits payments (e.g., employers self-insuring for these benefits bear a large portion of the risk) and payments are related to earnings. One study determined that long-term disability claims account for about 0.25 active depression claims per 1,000 covered lives, with an average of 180 lost workdays per calendar year.<sup>28</sup>

Similarly, with Worker's Compensation, accidental injury due to a mental disorder accounts for a small portion of claims, relatively speaking, and claims are paid by the insurer. Nevertheless, as a few dramatic highly publicized events have demonstrated (e.g., the Germanwings Airline and Exxon Valdez accidents), a single on-the-job injury or accident can be extremely costly on many levels.

## Mortality

Deaths from suicide and substance abuse contribute to the cost of mental disorders in the workplace. Suicide represents a special case because a single employee suicide can be devastating to others in the workplace and exact a large cost. However, within a single organization, such events tend to occur relatively infrequently.

The U.S. National Center for Health Statistics reports that in 2013, there were 33,533 total deaths from suicide among individuals 15-64 years of age. A recent study of deaths from suicide in 17 states asked whether suicide rates differed among occupational groups (Figure 12). The overall suicide rate per 100,000 population (within an occupation) was 20.3. The male rate was more than three times the female rate (39.2/100,000 vs. 12.4/100,000, respectively). The occupations with the highest rates are those with the highest male to female worker ratios.<sup>29</sup>

**Figure 12. Rates of suicide per 100,000 population, by sex, and ranked overall by Standard Occupational Classification (SOC) group – 17 states, 2012\***

SOC code	Occupational group	Overall	Male	Female
45	Farming, fishing, and forestry	84.5	90.5	—*
47	Construction and extraction	53.3	52.5	—
49	Installation, maintenance, and repair	47.9	47.5	—
51	Production	34.5	39.5	10.8
17	Architecture and engineering	32.2	36.3	—
33	Protective service	30.5	34.1	14.1
27	Arts, design, entertainment, sports, and media	24.3	32.9	12.4
15	Computer and mathematical	23.3	32.8	12.5
53	Transportation and material moving	22.3	30.2	4.8
11	Management	20.3	27.4	8.4
23	Legal	18.8	24.2	13.9
29	Healthcare practitioners and technical	17.4	31.6	13.3
19	Life, physical, and social science	16.7	23.7	—
13	Business and financial operations	15.9	20.4	10.3
31	Health care support	14.6	32.9	11.8
21	Community and social service	13.6	18.6	8.9
41	Sales and related	13.4	21.0	5.3
37	Building and grounds cleaning and maintenance	13.3	16.5	4.5
35	Food preparation and serving related	12.8	19.3	7.7
39	Personal care and service	8.0	17.2	4.9
43	Office and administrative support	7.9	15.2	5.3
25	Education, training, and library	7.5	15.1	4.7
<b>Total</b>		<b>20.3</b>	<b>39.2</b>	<b>12.4</b>

\* Rates were calculated using data from the U.S. Census Current Population Survey March supplement.

\* Rates were not calculated where the decedents were fewer than 20 because those estimates might be unreliable.

Source: US Centers for Disease Control and Prevention National Violent Death Reporting System (NVDRS) and adapted from McIntosh, W. L. (2016). Suicide rates by occupational Group—17 States, 2012. MMWR. Morbidity and Mortality Weekly Report, 65.

**See Technical Note 12.**

In addition to suicides, between 2008 and 2009, an estimated 0.3% of full-time employed individuals at least 18 years of age had attempted suicide and, among part-time employed, the rate was 0.6%. Further, mortality related to alcohol and/or drug use is reported separately from suicides; the rate for drug-induced deaths was 14.7/100,000 and 9.0/100,000 for alcohol-induced deaths.

## **D. Employed Informal Caregivers Suffer Productivity Loss**

In 2015, an estimated 18.2% of the adult population, 43.5 million Americans, served as unpaid (i.e. “informal”) caregivers of which six in ten were employed.<sup>30</sup> According to a survey from the National Alliance for Caregiving and AARP, <sup>30</sup> 70% of employed caregivers had to modify their work situations by reducing their work hours, finding a less demanding job, turning down a promotion, taking a leave of absence or retiring early.

An estimated 8.4 million adults provided unpaid assistance to individuals with emotional or mental health problems. <sup>30</sup> The impact of caregiving responsibilities on individuals who also are employed is just beginning to be elucidated.

A recent study addressed this topic for informal caregivers of individuals with schizophrenia and/or schizoaffective disorder.<sup>31</sup> In a four-week period, currently employed informal caregivers were limited at work between 20% of the time on average (in relation to performing physical job tasks) to almost 30% of the time on average, respectively, for time management and mental and interpersonal job task performance. On average, at-work productivity was down 7.7%. In the same period, almost two-thirds missed work due to informal caregiving responsibilities. Average productivity loss due to work absences was 15%.

## **Health Care Expenditures are Related to Excess Costs for both Mental and Physical Health Conditions**

In-depth analysis of the medical and pharmacy claims of employed adults offers additional compelling evidence of the high costs of depression to business. A detailed report focusing on the costs of major depressive disorder<sup>32</sup> found that part of the high cost of major depression results from its care but a substantial part also stems from the care of its co-occurring conditions. These conditions include other forms of depression, other mental disorders and medical illnesses. The reasons for this co-occurring disorder phenomenon are not completely understood but science suggests multiple mechanisms may be responsible and, therefore, co-occurrences are relatively common. However, importantly, when a mental disorder co-occurs with another illness, it is often more difficult to treat one or more of the health problems, outcomes tend to be poorer and costs are higher.

When evaluating health care costs (also known as the “direct” costs of care), the important statistic is the incremental cost, which refers to the excess cost over the cost of care for a non-depressed employee. The incremental cost of care due to major depressive disorder for privately-insured employed adults ages 18-64 has been documented carefully.<sup>32</sup>

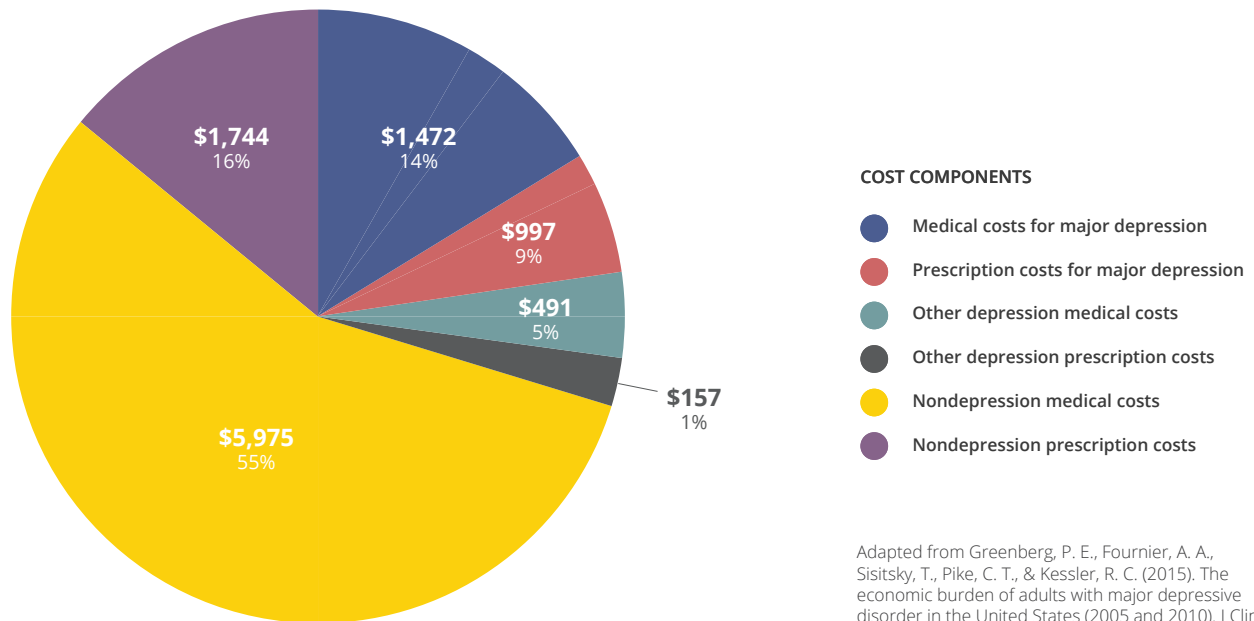
Research indicates that an employed person with major depression accrues average annual health care costs of \$10,836 (in 2016\$); (Figure 13). A similar employed person without major depression has an average annual health care cost of \$4,584. The incremental difference major depression adds is \$6,253 per depressed employee per year (Figure 14).

Of this incremental cost, \$2,469 (39%) is the annual cost for treatment of major depression (Figure 14). These costs include outpatient care (\$903 or 14% of the total incremental cost) and prescribed medications (\$997 or 16% of the total incremental cost). Inpatient care for major depression is less than half of the outpatient costs (\$429 or 7% of the total incremental cost). The incremental cost of care for other forms of depression is \$610 per year (or 10% of the total incremental cost). Other co-occurring non-depression health care costs are \$7,719 on average per year for those with major depression vs. \$4,547 for employees without major depression (incremental cost of \$3,173; 51% of the total incremental cost).

It is important to highlight the fact that the care of medical conditions is a major source of these excess costs. In the study on which these statistics are based, the assessment was conservative and only included the costs of physical illnesses that conceivably have a link to depression symptoms (such as musculoskeletal pain). In total, in the group of employees with major depression, annual costs are more than twice those of similar, non-depressed employees with much of it representing the care received for medical conditions.

Another costly group of employees includes individuals with a diagnosis of major depression but no claims for depression treatment. This is an untreated depression group. Within this group, the incremental health care costs are \$3,409 per employee per year.

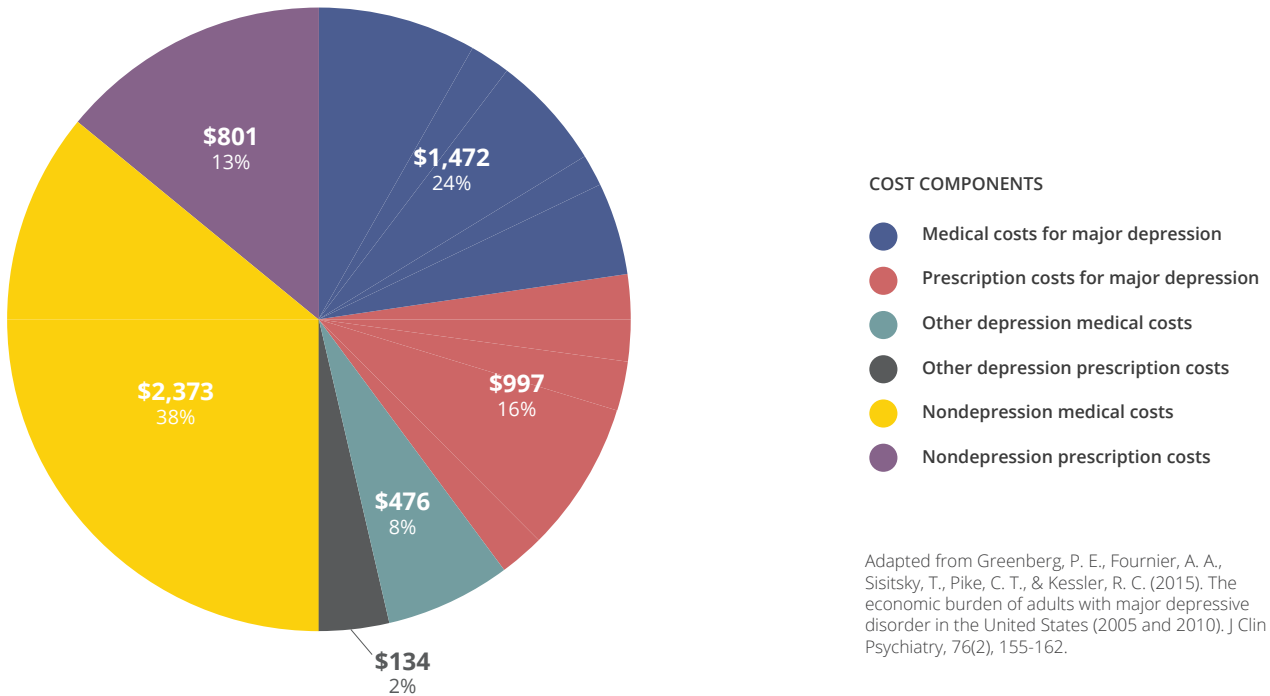
**Figure 13. Average costs per employed patient with major depressive disorder**



Adapted from Greenberg, P. E., Fournier, A. A., Sisitsky, T., Pike, C. T., & Kessler, R. C. (2015). The economic burden of adults with major depressive disorder in the United States (2005 and 2010). *J Clin Psychiatry, 76*(2), 155-162.

See Technical Note 13.

**Figure 14. Average incremental costs for employed patients with major depressive disorder compared to employed patients without the disorder**



See Technical Note 14.

The failure to treat depression effectively, or the failure to encourage those with depression to seek help results in vastly increased costs for other health problems both physical and mental. A particular linked condition, diabetes, which was not included in this direct cost analysis, is examined next.

## Mental Disorders Make it Harder and More Expensive to Treat Other Conditions: The Case of Diabetes and Depression

Depression is also linked to behavioral risks including obesity and tobacco use as well as higher costs and poorer outcomes of chronic health problems. The incremental cost of depression for individuals with diabetes is well established and provides an illustrative example.

Approximately 4.6% of the privately insured U.S. population has diabetes, and the rate of diabetes has been increasing.<sup>33</sup> Approximately 12% of the population with diabetes has comorbid major depressive disorder.<sup>34,35</sup>

Depression among diabetic individuals tends to be severe with a high relapse rate. Compared to diabetes without depression, self-care and treatment adherence are worse for both conditions as are treatment outcomes. However, roughly two-thirds of patients with diabetes and depression are not receiving treatment for their mental disorder.<sup>36</sup>

According to national data on adults, regardless of employment status, depression has a large effect on the treatment costs of diabetes. Among those with unrecognized and asymptomatic depression, annual health care costs are \$2,000 to \$3,000 higher than the costs for diabetics without depression. For those with symptomatic depression, the incremental health care costs are \$5,000 higher per year. The incremental costs associated with work absences, presenteeism and employment separations are not known but assumed to be substantial.<sup>37</sup>

## Summary and Guide to the Depression Cost Calculator

Mental disorders—too many of which are unrecognized, untreated and receiving suboptimal treatment – are hurting the bottom line and causing unnecessary human suffering. This is not an abstract issue affecting only a small group of employers. It is a problem for most employers and the people they care about most – their employees and dependents.

The next step is to find out exactly how much mental disorders among employees are costing your company. What is the bottom line impact? The conclusions of this paper can be found in Figure 15. These calculations are based on a hypothetical employer with 10,000 employees, 55% of whom are female, and with average salary and benefits per employee of \$70,000 (total payroll of \$700 million) and total profit of \$70 million. The bottom line is that major depression will cost in one year more than \$17.2 million, equivalent to 24.6% of total profit.

Once launched, our online depression cost calculator will be available at:  
[www.onemindinitiative.org/seriousdepressioncalculator](http://www.onemindinitiative.org/seriousdepressioncalculator)

The online calculator is interactive, enabling users to input specific parameters such as total number of employees, female/male employee ratio, average employee salary and benefits, total payroll expenses and total profit. It cannot be emphasized too strongly how conservative the cost calculator is. We have looked at the costs of one condition alone – serious depression – where our research showed that the publicly available data had sufficient integrity.

**Figure 15. The employer's one-year full cost of major depression: Example of the cost calculator in 2016 dollars**

This example includes the following assumptions: average employee earnings of \$70,000 annually, 10,000 employees, 55% female/45% male, 30% of employees with depression receive depression treatment

Cost component	One-year cost per employee with depression	One-year total employer cost (000)	Total cost as a percentage of \$70M profit
<b>Incremental direct costs of medical and pharmacy claims</b>			
Treatment for major and other depression	\$924	\$909.51	1.30
Treatment for medical and psychiatric disorders comorbid with depression	\$951	\$936.64	1.34
Treatment for disorders of employees with untreated diagnosed major depression	\$4,157	\$4,092.85	5.85
Treatment for diabetes with unrecognized, asymptomatic confirmed depression	\$97	\$95.10	0.14
<b>Work disability days of employee claimants with diagnosed depression</b>			
Short-term disability days	\$410	\$403.2	0.58
Long-term disability days	\$128	\$126.00	0.18
<b>Absenteeism and presenteeism costs due to depression</b>			
Absence days (Unrelated to disability claims)	\$4,900	\$4,824.05	6.89
Presenteeism (At-work productivity loss)	\$4,550	\$4,479.48	6.40
<b>Absenteeism and presenteeism costs due to caregiving for depression</b>			
Absence days (unrelated to disability claims) and presenteeism (at-work productivity loss)	\$1,317	\$1,296.57	1.85
<b>Replacement costs</b>			
Deaths due to suicide	\$16	\$15.41	0.02
Job turnover	\$63	\$62.02	0.09
<b>Total</b>	<b>\$16,613</b>	<b>\$17,240.83</b>	<b>24.63</b>

There are many other mental or behavioral conditions in the employed workforce including milder depression, anxiety, and substance use disorder. None of these costs have been included. However, notwithstanding the conservatism of our analysis, and whatever the workforce size or mix, this report and the information in Figure 15 drive home a number of business conclusions:

First, mental disorders affect all businesses. This is because of their prevalence in the workforce, including in the privately insured workforce.



Second, for a business of any size, costs of one mental health condition alone – major depression – are large.

Third, when it comes to a condition like major depression, measured costs like prescriptions are a small percentage of the actual costs. Anyone looking for savings at the level of prescriptions in any manner other than as part of driving their health care providers to deliver more effective and state-of-the-art treatment, is not only looking in the wrong place, but likely to be increasing overall costs for the business.

Fourth, given the very large percentage of sufferers from major depression who never access treatment coupled with the impact on productivity, where the productivity losses are a fivefold multiple of direct medical costs, encouraging sufferers to seek treatment and facilitating access is still the best option for reducing the human and economic burden of illness.

Fifth, looking at medical costs alone, given how depression interacts with other “physical” conditions like diabetes, reductions in risks for depression in a workforce coupled with improvements in depression treatment may be a multiplier for reducing costs associated with other expensive medical conditions and thus, overall health care costs.

Finally, given the multiple ways mental disorders impact the workforce and its well-being, business productivity, as well as business costs, they are truly a C-level issue demanding action.



## Additional Information About Mental Disorders

According to the U.S. Centers for Disease Control and Prevention, “depression is characterized by persistent sadness and sometimes irritability (particularly in children) and is one of the leading causes of disease or injury worldwide for both men and women. Depression can cause suffering for depressed individuals and can also have negative effects on their families and the communities in which they live. Depression is associated with significant health care needs, school problems, loss of work, and earlier mortality. Depression can occur at any time over a person’s life.”

“Although effective treatments are available, many individuals with depression do not have access to treatment or do not take advantage of services. If not effectively treated, depression is likely to become a chronic disease. Just experiencing one episode of depression places an individual at a 50% risk for experiencing another episode, and further increases the chances of having more depression episodes in the future.”

“According to the American Psychiatric Association’s diagnostic criteria for Major Depressive Disorder, a person must experience five or more symptoms below for a continuous period of at least two weeks.

- Feelings of sadness, hopelessness, depressed mood
- Loss of interest or pleasure in activities that used to be enjoyable
- Change in weight or appetite (either increase or decrease)
- Change in activity: psychomotor agitation (being more active than usual) or psychomotor retardation (being less active than usual)
- Insomnia (difficulty sleeping) or sleeping too much
- Feeling tired or not having any energy
- Feelings of guilt or worthlessness
- Difficulties concentrating and paying attention
- Thoughts of death or suicide.

Most symptoms must be present every day or nearly every day and must cause significant distress or problems in daily life functioning. <https://www.cdc.gov/mentalhealth/basics/mental-illness/depression.htm>”

“Anxiety disorders are characterized by excessive and unrealistic worry about everyday tasks or events, or may be specific to certain objects or rituals. Simple phobias involve excessive anxiety evoked by specific objects (e.g., marked fear of snakes). As its name implies, social phobias are fears of interacting with others, particularly in large groups. In obsessive-compulsive disorder (OCD), the individual experiences an obsession – an intrusive and recurrent thought, idea, sensation or feeling coupled with a compulsion – a behavior that is recurrent and ritualized, such as checking, avoiding, or counting. In addition to being helped by pharmacotherapies, anxiety disorders are often addressed by exposure (to the object or event obsessed over) and response prevention – not permitting the compulsive behavior, to help the individual learn that it is not needed.” <https://www.cdc.gov/mentalhealth/basics/mental-illness/anxiety.htm>

Additional information about mental disorders may be found on the National Institute for Mental Health website: <https://www.nimh.nih.gov/health/index.shtml>

# TECHNICAL APPENDIX

## FIGURE 1.

### Most costly 10 conditions among adults age 18 and older with any private insurance, 2014

Updated with 2014 data and adapted from – Soni, A. (2011). Top 10 most costly conditions among men and women, 2008: Estimates for the US civilian noninstitutionalized adult population, age 18 and older. Agency for Healthcare Research and Quality.

#### DATA SOURCE

Medical Expenditure Panel Survey (MEPS) 2014 Full Year Consolidated Data File (HC-121), Medical Conditions File (HC-120), Office-Based Medical Provider Visits File (HC-118G), Outpatient Visits File (HC-118F), Hospital Inpatient Stays File (HC-118D), Home Health File (HC-118H), Emergency Room Visits File (HC-118E), and Prescribed Medicines File (HC-118A). All child birth related expenditures were excluded from the top 10 most costly conditions. MEPS provides data on how frequently Americans utilize specific health services, the cost of these services, as well as the cost, scope, and breadth of health insurance among workers.

#### DATA YEAR(S)

2014

#### SAMPLE

The Medical Expenditure Panel Survey is a nationally representative household sample of the US civilian non-institutionalized population. The subsample used in Figure 1 includes privately insured only, defined below.

#### CODING AND CLASSIFICATION

Medical conditions -

Medical condition data were coded using the International Classification of Diseases, Ninth Revision (ICD-9). ICD-9-CM condition codes were then aggregated into clinically meaningful categories that group similar conditions using the Clinical Classification System software. Categories were collapsed when appropriate. The reported ICD-9-CM condition code values were mapped to the appropriate clinical classification category prior to being collapsed to 3-digit ICD-9-CM condition codes. The result is that every record which has an ICD-9-CM diagnosis code also has a clinical classification code.

Expenditures -

Expenditures are defined as payments from private insurance for hospital inpatient care, ambulatory care provided in offices and hospital outpatient departments, care provided in emergency departments, paid care provided in the patient's home (home health), and the purchase of prescribed medications. Expenditures were classified with a condition if a visit, stay, or medication purchase was cited as being related to the specific condition. Expenditures may be associated with more than one condition and are not unduplicated in the condition totals; summing over conditions would double-count some expenses.

Sources of payment -

Private Insurance

Includes payments made by insurance plans covering hospital and other medical care (excluding payments from Medicare, Medicaid, and other public sources), Medigap plans (for 65 years of age and older only), and TRICARE (Armed Forces-related coverage).

## FIGURE 2.

### Total expenditures for the 5 most costly conditions among the overall U.S. population and among the highest 5% based on their overall medical expenditures, 2012

Adapted from Cohen, S. B. (2014). The concentration of health care expenditures and related expenses for costly medical conditions, 2012. Agency for Healthcare Research and Quality.

#### DATA SOURCE

Medical Expenditure Panel Survey (MEPS) 2012 public use files: Full Year Consolidated Data File (HC-155), Medical Conditions File (HC-154), Office-Based Medical Provider Visits File (HC-152G), Outpatient Visits File (HC-152F), Hospital Inpatient Stays File (HC-152D), Home Health File (HC-152H), Emergency Room Visits File (HC-152E), Prescribed Medicines File (HC-152A), and Condition-Event Link File (HC-152I File 1). All child birth related expenditures were excluded from the top 10 most costly conditions. MEPS provides data on how frequently Americans utilize specific health services, the cost of these services, as well as the cost, scope, and breadth of health insurance among workers.

#### DATA YEAR(S)

2012

#### SAMPLE

The Medical Expenditure Panel Survey (MEPS) is a nationally representative household sample of the US civilian non-institutionalized population.

#### CODING AND CLASSIFICATION

For medical condition coding, see the technical notes for Figure 1.

Overall medical expenditures are defined as payments from all sources (listed below) for everything detailed in Figure 1's technical notes on expenditures.

Sources of payment -

Private insurance

Includes payments made by insurance plans covering hospital and other medical care (excluding payments from Medicare, Medicaid, and other public sources), Medigap plans (for 65 years of age and older only), and TRICARE (Armed Forces-related coverage).

Medicare

Medicare is a federally financed health insurance plan for the elderly, persons receiving Social Security disability payments, and those with end-stage renal disease. Includes Medicare Part A, Part B, and Part D.

Medicaid/CHIP

Medicaid provides health coverage to those who are unable to afford necessary medical care, while CHIP provides coverage to additional low income children not eligible for Medicaid.

Out of pocket

Includes expenses paid by the user or other family member.

Other sources

Includes payments from other federal sources such as the Indian Health Service, military treatment facilities, various state and local sources and unclassified sources.

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**FIGURE 3.****Percentage of those aged 12 and over who contacted a mental health professional in past 12 months, by depressive symptom severity: U.S., 2009-2012**

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Pratt, L. A., & Brody, D. J. (2014). Depression in the US Household Population, 2009-2012. Retrieved April 19, 2017.

**DATA SOURCE**

National health and Nutrition Examination Survey (NHANES), a survey conducted by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics (NCHS)

**DATA YEAR(S)**

2009-2012

**SAMPLE**

Civilian non-institutionalized US population, cross-sectional; excludes persons living in institutions, where rates of depression are higher than in the community-dwelling population.

**CODING AND CLASSIFICATION**

Contact with a mental health professional -  
Determined by responses to the question, "During the past 12 months, have you seen or talked to a mental health professional such as a psychologist, psychiatrist, psychiatric nurse, or clinical social worker about your health?" The data do not indicate whether persons who contacted a mental health professional actually began treatment for depression. Respondents also are not asked about mental health treatment received from primary care providers.

**Depressive symptoms -**

Measured using the Patient Health Questionnaire (PHQ-9), a nine-item screening instrument that asks about the frequency of symptoms of depression over the past 2 weeks. Depression is classified by a PHQ-9 score of 10 or higher, a well-validated cut point commonly used in clinical studies that measure depression.<sup>38</sup>

**Severity -**

Depression symptom severity was determined by various cut points using the total score from the PHQ-9. PHQ-9 scores can be classified as: 0-4 (no or minimal depressive symptoms), 5-9 (mild), 10-14 (moderate), 15-19 (moderately severe), and 20-27 (severe). In this data, scores of 15 and higher are referred to as severe depressive symptoms.

**ADDITIONAL METHODS**

NHANES sample examination weights, which account for the differential probabilities of selection, nonresponse, and non-coverage, were used for estimation and analyses. Standard errors of the percentages were estimated using Taylor series linearization, a method that incorporates the sample design and sample weights.

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**FIGURE 4.****Productivity loss due to presenteeism: top ten most expensive chronic conditions based on health risk assessment data\***

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**DATA SOURCE**

The data from Figure 4 comes from seven different web-based health risk assessments.

**DATA YEAR(S)**

Multiple sources from 2003-2011 (years covered varied by data source).

**SAMPLE**

3,464,424 observations of employees who completed health risk assessments.

**CODING AND CLASSIFICATION****Productivity loss -**

Productivity loss was measured by the Work Limitations Questionnaire (WLQ) short-form version, which contains eight questions. The WLQ produces four scale scores, weighted to indicate the amount of at-work productivity loss associated with performance limitations. At-work productivity loss is a percentage indicating the difference between the observed group and a comparison group of healthy US employees.

**Chronic conditions -**

The health assessment generates information about chronic health conditions and health risk factors. The specific health conditions and health risk factors included in this figure were common to all included health risk assessment forms.

**ADDITIONAL METHODS**

A combined database including data from all employees across companies and years includes the following for each employee record: each health problem, an indicator variable identifying the health risk assessment, employee age, gender, and five WLQ variables (the four WLQ scales and the WLQ Productivity Loss score). A unique encrypted identifier code was also used to adjust for multiple observations of the same person across years.

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**FIGURE 5.****Twelve-month prevalence estimates for mental disorders by diagnostic category-results from the national comorbidity survey-replication**

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Reproduced with permission from <https://www.hcp.med.harvard.edu/ncs/index.php>. Data source accessed April 20, 2017.

**Methodological Reference:**

Kessler, R. C., Merikangas, K. R., & Wang, P. S. (2008). The prevalence and correlates of workplace depression in the national comorbidity survey replication. *Journal of occupational and environmental medicine/American College of Occupational and Environmental Medicine*, 50(4), 381.

**DATA SOURCE**

National Comorbidity Survey Replication (NCS-R)

**DATA YEAR(S)**

2001-2003

**SAMPLE**

English-speaking adult household residents aged 18+ in the continental US.

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## DATA COLLECTION METHOD

The NCS-R collects data via face-to-face in-home interviews. There are two interview parts. Interview Part I involves a core diagnostic assessment of all respondents. Interview Part II involves questions about correlates and additional disorders administered to all Part I respondents who met lifetime criteria for any core disorder plus a roughly one-in-three probability sub-sample of other respondents (n = 5,692).

## CODING AND CLASSIFICATION

NCS-R diagnoses were based on Version 3.0 of the World Health Organization's Composite International Diagnostic Interview. Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) criteria were used to define all disorders. Both lifetime and 12-month prevalence rates were assessed.

Blinded clinical re-interviews using the non-patient version of the structured Clinical Interview for DSM-IV with a probability sub-sample of NCS-R respondents found generally good concordance between the Composite International Diagnostic Interview/DSM-IV diagnoses and independent clinical assessments.

## ADDITIONAL METHODS

A probability sub-sample of hard-to-recruit pre-designated respondents was selected for a telephone non-respondent survey. The results from this were used to weight the main sample for the probability of nonresponse.

## FIGURE 6.

### Rates of current common mental disorders (CMD) among employed adults in the United Kingdom by occupation

Stansfeld, S.A., Pike, C., McManus, S., Harris, J., Bebbington, P., Brugha, T., & Clark, C. (2013). Occupations, work characteristics and common mental disorder. *Psychological medicine*, 43(05), 961-973.

## DATA SOURCE

Adult Psychiatric Morbidity Survey

## DATA YEAR(S)

2007

## SAMPLE

Working subsample (n = 3,425), ages 16-64 from a stratified probability sample of those ages 16+ living in private households in Great Britain (England, Wales, and Scotland). The final n included respondents who were engaged in paid work in the week preceding the survey, were not self-employed, and had answered all questions relevant to the analysis.

## DATA COLLECTION METHODS

Residential addresses were randomly sampled using small user Postcode Address File and interviewers visited homes. 13,171 households were visited and 57% took part in this portion of the survey.

## CODING AND CLASSIFICATION

Common Mental Disorder -

The Revised Clinical Interview Schedule used to establish presence of non-psychotic Common Mental Disorder symptoms in the past week. Algorithms were used to derive the International Classification of Diseases, 10th Revision (ICD-10) diagnosis of: generalized anxiety disorder, mixed anxiety and depressive disorder, depressive episode, panic disorder, phobia, and obsessive-compulsive disorder.

Occupational Classification -

Occupations were classified as one of 371 occupations in accordance with the Standard Occupational Classification Schedule (SOC) 2000. Units were grouped into nine major SOC groups, and 25 sub-major SOC groups. The association between major and sub-major SOC groups and Common Mental Disorder was established through logistic regression, adjusting for age, gender, housing tenure, and marital status, and tested for interactions with gender. Throughout the analysis, the overall working sample was used as the reference group.

## ADDITIONAL METHODS

A complex samples function was used to take account of weighting procedures. Weights were applied to represent the demographic structure of the national population, and to account for the probability of selection and nonresponse.

## FIGURE 7.

### Alcohol misuse and illicit drugs use in the past 30 days among U.S. employees by industry

Bush, D. M., & Lipari, R. N. (2013). Substance use and substance use disorder by industry.

[https://www.samhsa.gov/data/sites/default/files/report\\_1959/ShortReport-1959.html](https://www.samhsa.gov/data/sites/default/files/report_1959/ShortReport-1959.html)

Last accessed April 20, 107.

## DATA SOURCE

SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health (NSDUH)

## DATA YEAR(S)

2008-2012

## SAMPLE

Main study and clinical sample

## CODING AND CLASSIFICATION

Substance use disorder -

Per NSDUH methods, substance abuse and dependence are mutually exclusive, as defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). If a respondent is classified as having substance dependence (alcohol or illicit drugs), then he or she cannot be classified as abusing that substance regardless of responses to the abuse criteria questions. Illicit drugs include marijuana/hashish, cocaine (including crack), stimulants (including methamphetamine), heroin, prescription pain relievers, sedatives/hypnotics/anxiolytics, hallucinogens/PCP, and inhalants.

Employment status -

Respondents who reported that they did not have a job and did not want one were classified as not being in the labor force. Similarly, respondents who reported not having a job and looking for work also were classified as not being in the labor force if they did not report making specific efforts to find work in the past 30 days.

## ADDITIONAL METHODS

Diagnostic variables were set to "missing" if the respondent had insufficient non-missing data on criterion variables requisite to make a definitive "yes" or "no" diagnosis. Cases with missing values in the variables collected from

the clinical interview were excluded from the analyses. Weighted percentages were computed using the final analysis weights for the 2008-2012 MHSS clinical sample.

## FIGURE 8.

**Average number of absence days and average percentage of productivity lost due to absences\*\*for employed adults due to major depression and/or dysthymia: Results from Work and Health Initiative employee screening 2011-2015**

## FIGURE 9.

**Average percentage of time spent working with limitations in performance and average at-work productivity loss for employed adults due to major depression or dysthymia: Results from Work and Health Initiative employee screening 2011-2015\*\***

### DATA SOURCE

Online screening initiative as part of the Work and Health Initiative Study, a randomized clinical trial testing a work-focused intervention for depression, which was sponsored by the National Institute on Aging.

### DATA YEAR(S)

2011-2015

### SAMPLE

Employed US adults from 19 US companies and 5 organizations with employee members.

### CODING AND CLASSIFICATION

#### Depression screening –

Depression was measured using the Patient Health Questionnaire (PHQ)-9. The prevalence rate accounts for two-week major depressive disorder, dysthymia, or both.

#### Occupational status and coding –

Occupation was self-reported based on a checklist of occupational categories (US Standard Occupational Classification), which were then aggregated into the following four categories for analysis: white collar, blue collar, sales/service, and other.

The breakdown into categories is as follows –

White collar: Architecture and Engineering occupations, Arts, Design, Entertainment, Sports, and Media occupations, Business and Financial Operations occupations, Community and Social Service occupations, Computer and Mathematical occupations, Education, Training, and Library occupations, Healthcare Practitioners and Technical occupations, Legal occupations, Life, Physical, and Social Science occupations, Management occupations.

Blue collar: Building and Grounds Cleaning and Maintenance occupations, Construction and Extraction occupations, Installation, Maintenance, and Repair occupations, Production occupations, Transportation and Material Moving occupations.

Sales/service: Healthcare Support occupations, Protective Service occupations, Food Preparation and Serving occupations, Personal Care and Service occupations, Sales and Sales-Related occupations, Office and

Administrative Support occupations.

Other: Other occupations not otherwise specified.

#### Number of work days/hours missed –

Two questions on the screener ask participants to report both full and partial days missed from work over the previous two weeks. Measured with the Work Limitations Questionnaire (WLQ) Time Loss Module. Productivity loss due to absences is the number of hours missed due to depression in the past two weeks divided by usual work hours in the past two weeks. The results were adjusted statistically to reflect the unique impact of depression.

#### Work limitations –

Measured with the Work Limitations Questionnaire (WLQ). The WLQ generates four scale scores measuring limitations due to health problems on the job and overall at-work productivity loss, which is a validated algorithm reflecting the percentage difference in the sample observed compared to a healthy employee benchmark sample. Work limitations use a two-week recall period. The results were adjusted statistically to reflect the unique impact of depression.

## FIGURE 10.

**Major depression and/or dysthymia compared to employees with rheumatoid arthritis and healthy employees.**

### DATA SOURCE

Adapted from Lerner, D., Adler, D. A., Chang, H., Lapitsky, L., Hood, M. Y., Perissinotto, C., & Rogers, W. H. (2004). Unemployment, job retention, and productivity loss among employees with depression. *Psychiatric Services*, 55 (12), 1371-1378.

### DATA YEAR(S)

2001-2003

### SAMPLE

229 employees with depression (n=59 with dysthymia, n=85 with major depressive disorder, and n=85 with both dysthymia and major depressive disorder) and two employee comparison groups (n=173 were healthy patients and n=87 were rheumatoid arthritis patients).

#### Eligibility –

To be eligible participants need to be between 18 and 62 years of age and working at least 15 hours per week. Exclusions included plans to retire within two years, receipt of disability benefits, having an active disability claim, abusing alcohol or drugs, pregnancy or delivery within the past six months, having bipolar disorder, unable to speak or read English, or given a diagnosis of at least one of 11 potentially disabling medical conditions (full list included in article).

### MEASUREMENT DEFINITIONS

#### Mental health –

Mental health measurement included the three-item depression pre-screener from the World Health Organization, two items assessing bipolar disorder history, and a patient-administered depression screening instrument for assessing dysthymia (a chronic form of depression) and major depressive disorder.

#### Follow-up employment status –

Respondents were asked if they worked for pay at any time in the past two weeks and additional employment status questions.

Job retention versus job turnover-

Participants in employee subgroup were asked whether during the past six months they were fired, laid off, quit a job, changed occupations, changed employers, or became self-employed.

#### ADDITIONAL METHODS

Outcomes were compared across five groups (dysthymia, major depression, both dysthymia and major depression, rheumatoid arthritis, or healthy control) and were assigned to each group based on a multi-step screening process. Participants with rheumatoid arthritis and depression (n=8) were classified as having rheumatoid arthritis.

### FIGURE 11.

#### Short-Term Disability Days Due to Depression

The Full Costs of Depression in the Workforce, Research by the Integrated Benefits Institute (2009) <https://ibiweb.org/research-resources/detail/the-full-costs-of-depression-in-the-workforce> Last accessed April 20, 2017

#### DATA SOURCE

Ingenix short-term disability claims data

#### DATA YEAR(S)

January 2001 – March 2004

#### SAMPLE

400,928 unduplicated employees from six companies

#### DATA COLLECTION

Employee group health, pharmacy and disability claims activities were observed at monthly intervals between January 2001 and March 2004. Each employee was observed for an average of 29.2 months. More than 45,000 of those employees filed a short-term disability claim. The results were then analyzed in the context of a large national employee self-reporting database populated by the Health and Work Performance Questionnaire (Kessler et al. 2003), including information on 27 self-reported chronic health conditions, including depression.

#### CODING AND CLASSIFICATION

Comparison-group definitions -

Control group: employees who filed a short-term disability claim for a diagnosis other than depression with no subsequent depression treatment.

Depression group: employees who filed a depression-diagnosis short-term disability claim

Co-morbid group: employees who filed a short-term disability claim for a diagnosis other than depression and who had concurrent and/or subsequent depression medical treatment.

Depression diagnosis -

Employees were categorized as with or without depression based on whether or not depression was identified as a primary or secondary diagnosis on any group health or short-term disability claim during or prior to the period between the time of their first claim and the end of their observed employment period. Depression diagnosis was identified by the International Classification of Disease (ICD)-9 codes associated with each claim.

### FIGURE 12.

#### Rates of suicide per 100,000 population, by sex, and ranked overall by standard occupation Classification (soc) group – 17 states, 2012\*

McIntosh, W. L. (2016). Suicide rates by occupational Group—17 States, 2012. MMWR. Morbidity and Mortality Weekly Report, 65.

#### DATA SOURCE

US Centers for Disease Control and Prevention National Violent Death Reporting System (NVDRS)

#### DATA YEAR(S)

2012

#### SAMPLE

Occupational codes were ascribed to 12,312 suicides in 17 states

#### CODING AND CLASSIFICATION

Death due to violence -

Defined as “the intentional use of physical force or power against oneself, another person, or against a group or community”.<sup>39</sup> The NVDRS collected information about deaths that meet this case definition according to the underlying manner of death coded on the death certificate, using the International Classification of Disease (ICD)-10 to code the cause of deaths.

Occupational classification -

NVDRS Occupation Title and Industry Title fields were used to assign each suicide decedent to one of the major occupational groups defined by the US Standard Occupational Classification (SOC) system. Occupation at time of death was coded, and each decedent was assigned to only one occupational group.

SOC Code assignment -

The National Institute for Occupational Safety and Health's Industry and Occupation Computerized Coding System (NIOCCS) was applied to the 12,312 suicides in the data set, resulting in SOC codes for 5,532 decedents. NIOCCS matched the industry and occupation text fields to US Census Industry and Occupation codes; these were mapped to detailed SOC codes, which the authors collapsed into major SOC occupational groups. A computer algorithm (developed based on a review of cases for which a SOC code was not provided by NIOCCS) was used to produce codes for an additional 4,572 decedents. Manual coding was used for the remaining 2,208 decedents. Occupation fields were blank for 729 decedents and were coded as “unknown.”

#### ADDITIONAL METHODS

Rates of suicide were calculated for each group using denominators derived from the US Census Bureau's Current Population Survey March 2013 Supplement. Rates were not calculated for occupation codes created by the authors because the Current Population Survey data set does not provide denominator data for these groups. Only decedents 16 years of age and older were included, as US child labor laws prohibit persons under 16 from working full time. SOC code 55 (military specific occupations) were not included in analysis because it was not possible to reliably determine whether these decedents were on active duty or retired, or which occupation they held in the military. If a decedent had a specific coded job and was employed by the military, he or she was coded according to that occupation.



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**FIGURE 13.**  
**Average costs per employed patient with Major Depressive Disorder**

**FIGURE 14.**  
**Average incremental costs for employed patients with Major Depressive Disorder compared to employed patients without the disorder.**

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Adapted from Greenberg, P. E., Fournier, A. A., Sisitsky, T., Pike, C. T., & Kessler, R. C. (2015). The economic burden of adults with major depressive disorder in the United States (2005 and 2010). *J Clin Psychiatry*, 76(2), 155-162.

**DATA SOURCE**

OptumHealth Reporting and Insights administrative claims database

**DATA YEAR(S)**

2005 and 2010. Only the 2010 data year were used. See below for additional methods.

**SAMPLE**

Individuals between the ages of 18 and 64 with diagnosed Major Depressive Disorder (MDD). Patients with Major Depressive Disorder were included for analysis if they had at least two claims for Major Depressive Disorder – 296.2 (single episode) or 296.3 (recurrent episode) according to the International Classification of Diseases, Ninth Revision (ICD-9-CM) – occurring on different dates during one of the two study years. Patients were required to have continuous health care eligibility during the study period. Patients with HMO, capitated, or Medicare coverage were excluded.

**COST ESTIMATION**

Incremental direct costs in 2010 involved three categories of cost estimation – Major Depressive Disorder costs, other depression costs, and non-depression costs. Patients with Major Depressive Disorder were matched 1-to-1 to controls who were patients with no Major Depressive Disorder diagnosis and no prescription for an antidepressant or antipsychotic drugs during the study years.

Incremental costs were calculated by subtracting average costs of controls from those of Major Depressive Disorder patients. Direct costs were estimated by employment status and treatment status as follows: 1) for employed and treated, costs estimated from claims data; 2) for employed and not treated – Major Depressive Disorder costs set equal to 0, and non-Major Depressive Disorder costs (cost categories 2 and 3) set equal to those incurred by employed and treated.

Other mental health comorbidities as part of total direct costs fall under “other depression costs” and include medical costs that occurred on the same day and in the same location as a medical claim with a diagnosis for another type of depression but not Major Depressive Disorder specifically, as well as pharmaceutical costs for antianxiety and anticonvulsant drugs. Mental comorbidities were identified using ICD-9-CM diagnosis codes and include the following: Anxiety disorders, adjustment disorders, sleep disorders, mood disorders, miscellaneous other mental disorders, Attention Deficit Disorder, alcohol abuse, screening for disorders, drug abuse, schizophrenia, sexual and gender identity disorders.

**ADDITIONAL METHODS**

Data from 2010 was reported in 2012 dollars in Greenberg’s paper. Results were converted to 2016 dollars using as a multiplier the Personal Consumption Expenditure Index and following recommendations from the Agency for Healthcare Research and Quality and the 2nd Panel on Cost Effectiveness in Health and Medicine. <sup>40</sup>

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## ONE MIND INITIATIVE™

One Mind partners, The Kennedy Forum and the One Mind Institute are pleased to announce their establishment of the One Mind Initiative at Work. Funded by Janssen Research & Development, LLC ("Janssen"), one of the Janssen Pharmaceutical Companies of Johnson & Johnson, this exciting new Initiative will galvanize broad-scale transformation in mental health, an integral element of overall well-being.

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### WHAT IS THE ONE MIND INITIATIVE?

A global coalition of leaders from diverse sectors including business, medicine, research, education, law enforcement, the military and civil society. These leaders will join together with the goal of transforming approaches to mental health and addiction.

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## ONE MIND INITIATIVE™ at work

This is the Initiative's first project that will focus on the development and implementation of a gold standard for workplace mental health and well-being. We believe that a committed group of CEOs can transform how mental health is viewed and approached in the workplace, how health care is purchased under the new paradigm, and how we can gain equity, collaboration and parity between physical and mental health.

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