REAL COSTS OF SUBSTANCE USE IN YOUR WORKFORCE

SHATTERPROOF STRONGER THAN ADDICTION

NATIONAL SAFETY COUNCIL

In partnership with independent research support from NORC at the UNIVERSITY of CHICAGO

A Substance Use Cost Calculator for Employers - Methodology

Risky use of alcohol, prescription pain medication misuse, and other drug use disorders[1] are among the most common and costly health conditions affecting Americans. The Surgeon General reports that in 2015, 66.7 million people in the United States reported drinking more than five drinks on one occasion at least once in the past month and 27.1 million adolescents and adults used illicit drugs or misused prescription drugs.[2] The costs to the individuals and families are grave. Alcohol contributes to 88,000 deaths each year in the US; one in 10 deaths among working adults are alcohol related.[3] Added to that, in 2014, there were 47,055 drug overdose deaths: 28,647 of whom died from overdoses from prescription pain relievers or heroin.[4]

The cost of substance use to American businesses may not be as apparent. Despite estimates that the national bill for substance use annually is more than $400 billion,[5] individual companies may not see how substance use impacts their bottom lines through lost productivity and absenteeism, health care expenses, disability and workers' compensation, and increased taxes to pay for law enforcement, criminal justice, and publicly-supported medical treatment. Business leaders remain largely in the dark about how substance use impacts their companies and what they can do to reduce their risks and costs.[6, 7, 8, 9]

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[1] Substance use disorder (SUD) is a condition in which the use of one or more substances leads to a clinically significant impairment or distress. SUDs can include any psychoactive drug, for example alcohol, prescription pain medications, heroin, cocaine and marijuana.

[2] Vivek V.H. Facing Addiction in America: Surgeon General's Report on Alcohol, Drugs, and Health. https://addiction.surgeongeneral.gov/surgeon-generals-report.pdf

[3] Stahre, M., Roeber, J., Kanny, D., Brewer , R. D., & Zhang, X. (2014). Contribution of excessive alcohol consumption to deaths and years of potential life lost in the United States. *Preventing Chronic Disease, 11*(E109).

[4] Rudd, R. A., Aleshire, N., Zibbel, J. E., & Gladden, R. M. (2016). Increases in drug and opioid overdose deaths — United States, 2000–2014. *MMWR, 64*(50), 1378-1382.

[5] Sacks, J. J., Gonzales, K. R., Bouchery, E. E., Tomedi, L. E., & Brewer, R. D. (2015). 2010 national and state costs of excessive alcohol consumption. *American Journal of Preventive Medicine, 49*(5), e73-e79. National Drug Intelligence Center. (2011). *National drug threat assessment.* Washington, DC: U.S. Department of Justice.

[6] Harwood, H.J. and Reichman, M.B. (2000). The Cost to Employers of Employee Alcohol Abuse: A Review of the Literature in the United States of America. United Nations Office on Drugs and Crime. *Bulletin on Narcotics*, Vol. LII, Nos. 1 & 2, 2000.

[7] Harwood, H.J., Malhotra, D. et al. (2002). *Cost Effectiveness and Cost Benefit Analysis of Substance Abuse Treatment: An Annotated Bibliography.* U.S. Department of Health and Human Services. Substance Abuse and Mental Health Services Administration. Center for Substance Abuse Treatment.

[8] Harwood, H.J., Malhotra, D. et al. (2002). *Cost Effectiveness and Cost Benefit Analysis of Substance Abuse Treatment: A Literature Review.* U.S. Department of Health and Human Services. Substance Abuse and Mental Health Services Administration. Center for Substance Abuse Treatment.

[9] Holder, H.D. Lennox, R.D. and Blose, J.O. (1992). The Economic Benefits of Alcoholism Treatment: A Summary of Twenty Years of Research. *Journal of Employee Assistance Research*, 1(1), 63-82.

The Substance Use Calculator for Business has been designed by NORC at the University of Chicago, the National Safety Council, and Shatterproof, a national nonprofit focused on ending addiction, as an authoritative, easy to use tool that provides business leaders with specific information about how alcohol, prescription pain medication misuse, and illicit drug use impacts their workplaces. It also provides research-proven steps they can take to help employees with substance use problems and, at the same time, increase the safety, health, and productivity of their workforces. The Calculator updates an earlier Substance Use Disorder Calculator introduced by this research team in 2003, and most recently refreshed in 2009.[10] This document describes in detail the methods used to derive these estimates.[11]

[10] www.alcoholcostcalculator.org, www.alcoholcostcalculator.org/sub

[11] Acronyms

- BLS Bureau of Labor Statistics
- NCQA National Committee on Quality Assurance
- NSDUH National Survey on Drug Use and Health
- SAMHSA Substance Abuse and Mental Health Services Administration
- NIAAA National Institute on Alcohol Abuse and Alcoholism
- NIDA National Institute on Drug Abuse

Methods

Sources of Data

Three years of data from the annual Federal substance use epidemiological survey, the National Survey on Drug Use and Health[3] (NSDUH) 2012-2014[12] are the primary sources for the Calculator. The Substance Abuse and Mental Health Services Administration (SAMHSA) conducts the NSDUH, each year interviewing a nationally representative sample of approximately 69,000 persons ages 12 and above. Public use data (PUD) files are made available about 18 months after the annual survey results are released. The PUD files contain weighted, anonymized data from approximately 55,000 adolescents and adults. Questions include lifetime, annual, and past-month usage of alcohol, marijuana, cocaine, hallucinogens, heroin, inhalants, tobacco, pain relievers, tranquilizers, stimulants, and sedatives. The NHSDUH survey also covers mental health and physical health symptoms, mental health and substance use treatment history, health care utilization and health insurance coverage. Demographic data, include gender, race, age, ethnicity, educational level, job status, workplace characteristics, and income. NORC separately analyzed the 2012-2014 NSDUH PUD and averaged the results. All respondents employed full- or part-time were included in analyses (25,201 in 2012; 25,235 in 2013; 27,030 in 2014). Respondents who did not report paid employment in the prior year were excluded from the analyses. The NSDUH survey is constructed so that DSM-IV diagnoses of substance use disorders can be derived.[13] Nationally, 0.7% of working adults have a pain medication use disorder, 1.7% used a pain reliever non-medically within the previous 30 days, 7.9% had an alcohol use disorder, 2.5% an illicit drug use disorder, and 1.7% a marijuana use disorder. Overall, 8.6% of adults had a substance use disorder.

[12] Public use data files of the NSDUH were analyzed online at http://pdas.samhsa.gov/#/?_k=m9xwxh
[13] Center for Behavioral Health Statistics and Quality. (2016). Impact of the DSM-IV to DSM-5 Changes on the National Survey on Drug Use and Health. Substance Abuse and Mental Health Services Administration, Rockville, MD. https://www.samhsa.gov/data/sites/default/files/NSDUH-DSM5ImpactAdultMI-2016.pdf

The Survey Documentation and Analysis (SDA, version 3.5) was the primary online software to analyze the NSDUH.[14] The data and SDA are part of the Substance Abuse and Mental Health Data Archive maintained by the Inter-University Consortium for Political and Social Research at the University of Michigan and the SAMHDA Public-use Data Analysis System (PDAS).[15]

Adjusting Prevalence Estimates: States

There are substantial differences between states in the prevalence of prescription pain medication misuse and substance use disorders generally. SAMHSA pools several years' NSDUH data to provide state estimates of substance use.[16, 17] In order to account for these differences, the average prevalence of prescription pain medication misuse and substance use disorders for persons 18 years and older in each state 2012-2014 was divided into the national prevalence rate for this age group. The national prevalence of prescription pain medication misuse in the past 12 months is 4.2 percent. At the higher end are Arizona (5.2%), Oklahoma (5.1%), Alabama (5.0%), and Oregon (5.0%). At the lower end are Wyoming (3.4%), Florida (3.4%), Maine (3.4%), and Vermont (3.34%).

The prevalence of any substance use disorder, including alcohol use disorder, is much higher. Among working age adults nationally, 8.6% had an alcohol or drug use disorder. States ranged from Utah and Tennessee at 7.4% of 18 year olds and above, to Washington D.C. (13.4%), Rhode Island (10.8%) and Montana (10.0%).

[14] Survey Documentation and Analysis (SDA), an online analysis system was developed and is maintained by the Computer-assisted Survey Methods Program (CSM) at the University of California, Berkeley. SDA results are comparable to SAS, Stata, and SUDAAN. For more information on SDA 3.5: http://sda.berkeley.edu/document.htm.

[15] http://datafiles.samhsa.gov/info/analyze-public-data-nid6

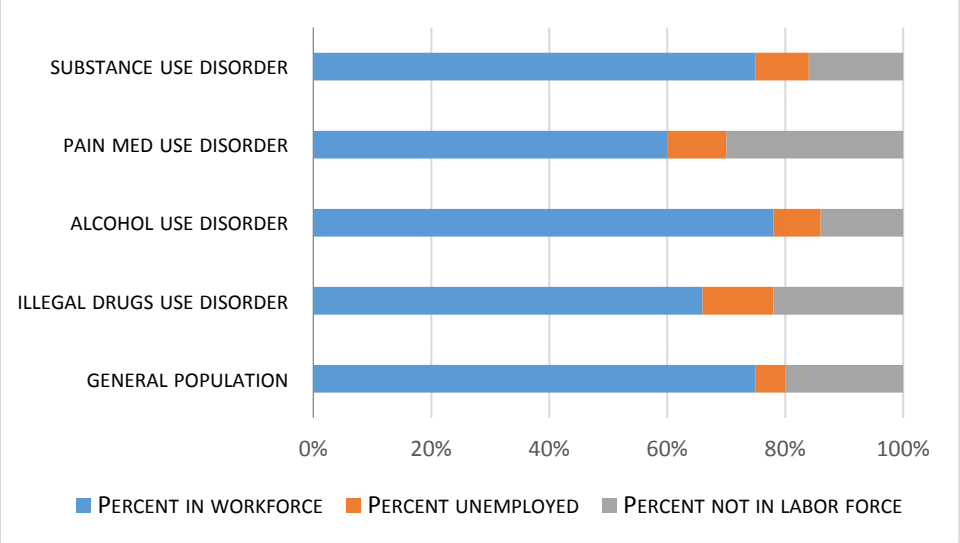
[16] Substance Abuse and Mental Health Services Administration. Behavioral Health Barometer: United States, 2014. (2015). HHS Publication No. SMA–15–4895. Rockville, MD.: SAMHSA.

[17] Substance Abuse and Mental Health Services Administration. (2015). National Survey on Drug Use and Health: Comparison of 2012-2013 and 2013-2014 Population Percentages (50 States and the District of Columbia) http://www.samhsa.gov/data/sites/default/files/NSDUHsaeShortTermCHG2014/NSDUHsaeShortTermCHG2014.htm. SAMHSA does not report state-specific rates of opioid disorder but does provide state rates of prescription pain medication misuse in previous 30 days.

Adjusting Prevalence Estimates: Industry Sector

Most people with substance use disorders work. In the age group between 18 and 64 years, 75% of adults with a substance use disorder are in the workforce. Similarly, 78% of adults with an alcohol use disorder are in the workforce. A smaller proportion of adults who report past month misuse of pain medications are in the workforce (68%), and still fewer who have a pain medication use disorder (60%). Adults with substance use disorders are about twice as likely to be unemployed (9% vs. 5%). Table 1 below shows that the majority of adults with a substance use disorder work. People who misuse pain medications are less likely than the general population and others with a substance use disorder to be out of the labor force.

Table 1. The majority of adults with a substance use disorder work.



Two thirds (67%) of workers with a substance use disorder are male, a ratio that holds for alcohol, illicit drug, and pain medication use disorders. Recent pain medication misuse is less skewed towards males (59%). Workers with a substance use disorder are more likely than their peers to be younger, have a lower family income, and less likely to be married.

Table 2. Workers with a substance use disorder are more likely to be male, unmarried, and have a lower income.

	Overall US Workforce	Pain med use disorder	Any substance use disorder
Male	53%	61%	67%
Married	54%	28%	33%
Between 18 to 34 years	34%	66%	55%
Family income below $20K	12%	24%	18%

The NSDUH elicits information about employment status, industry sector, and occupation. Respondents select among 16 categories for the industry sector of their current job, and 14 occupational categories. The proportion of NSDUH respondents who report working in specific industries generally mirrors rates reported by the Bureau of Labor Statistics.[18] Table 3 on the next page compares the proportion of the US workforce employed in 14 industry sectors per the Bureau of Labor Statistics and the corresponding percentage of NSDUH respondents in those industries in the three years sampled. The third column shows the total number of NSDUH respondents working in each industry.

Table 3. Industry representation in the NDSUH is generally good.

	BLS 2014 (%)	NSDUH (%)	Number in NSDUH
Agriculture, forestry, fishing, and hunting	1.4	1.4	1,254
Mining	0.6	0.6	605
Construction	4.1	7.5	15,357
Manufacturing	8.1	10.5	7,380
Utilities and transportation	3.5	5.0	3,032
Information	1.8	2.3	1,386
Wholesale trade	3.9	2.5	1,697
Retail trade	10.2	10.5	10,452
Financial activities	5.3	6.5	4,022
Professional and business services	12.7	11.9	8,214
Educational services, health	14.3	22.3	17,294
Leisure and hospitality	9.8	9.3	11,125
Government, public administration	14	4.6	3,118
Other services	4.2	5.6	4,193

[18] Henderson R. (2015). Industry employment and output projections to 2024. Monthly Lab. Rev. 138:1. The only exceptions are in the categories education and health, which in 2014 composed 14% of the workforce and government, which composed 14%. The comparable NSDUH categories were 12% for education and health, and 5% for public administration. Discrepancies are likely a result of the NSDUH assigning some government worksites to education and health.

Work Days Missed

The NSDUH asks respondents to recall how often they missed work due to illness and injury or skipped work in the past 30 days. Responses to these two questions are summed and annualized to measure the total number of missed workdays per year.

Health Care Use

Respondents are asked about health care use in the prior 12 months: how many times they had gone to a hospital emergency room, whether they had been hospitalized overnight, and, if so, for how many nights, and the number of outpatient primary care visits. Respondents were also asked about past 12 month and lifetime substance use treatment.

Cost of Health Care

The Surgeon General's 2016 report "Facing Addiction in America" notes that the US spends roughly $35 billion per year to treat substance use disorders, and another $85 billion to treat the injuries, infections, and illnesses associated with risky and dependent substance use.[19, 20] If the payment of the combined $120 billion cost were spread evenly across the total US population in 2016, the result would be an annual cost of $370 for each person in the US.

The expense of treatment for substance use disorders in the US is not borne solely by families or by their insurance companies. With higher utilization of health care services as a result of a substance use disorder, health insurance premiums may rise. This can affect employers who offer health insurance for employees, as the average organization covers 82% of individuals' premiums and 71% of family premiums.

[19] Vivek H, Murthy MD. Facing Addiction in America: Surgeon General's Report on Alcohol, Drugs, and Health. https://addiction.surgeongeneral.gov/surgeon-generals-report.pdf Substance Abuse and Mental Health Services Administration. (2016). Behavioral health spending and use accounts, 1986–2014. (HHS Publication No. SMA-16-4975). Rockville, MD: SAMHSA.

[20] Levit, K. R., Kassed, C. A., Coffey, R. M., Mark, T. L., McKusick, D. R., King, E.,Stranges, E. (2008). Projections of national expenditures for mental health services and substance abuse treatment, 2004– 2014. (SAMHSA Publication No. SMA 08-4326). Rockville, MD: SAMHSA.

A second, more specific estimate of the excess costs of substance use can be calculated from NSDUH data about hospital, emergency department, and ambulatory primary care use. To project employers' health insurance costs, Federal government and hospital industry data are used for average paid claims for hospital nights, emergency department visits, and ambulatory care visits. The calculator uses industry sector-specific estimates of the prevalence of substance use disorders and sector-specific health care utilization rates to project an employer's excess health care costs for its workforce and for the dependents of its employees. The costs associated with family members are based on the prevalence and health care use of NHSDUH respondents with substance use disorders between the ages of 12 and 65. From the Healthcare Cost and Utilization Project (HCUP), average hospital paid claim per day in 2014 was $2,553.[21] The average emergency department visit cost $1,863 in 2013 and ambulatory visit was $103.[22, 23] These costs represent total paid claims. Individuals and workers' families would likely bear some responsibility depending on the cost-sharing mechanisms in their health insurance plan. Employers' costs are estimated by discounting paid claims by the percentage of employer's premium support for individual and family health insurance coverage.

Cost of Missed Work Days

The costs of missed work days are derived from wage data published by the US Bureau of Labor Statistics.[24] Average hourly salary and fringe are reported by BLS for each industry sector. The cost of missed work is computed by annualizing the difference in average number of work days missed by workers with a substance use or pain medication disorder in an industry sector and the average work days missed by all workers in that sector and multiplying that by the fully loaded

[21] HCUPnet, Healthcare Cost and Utilization Project (HCUP). Hospital charges and costs: http://hcupnet.ahrq.gov/HCUPnet.jsp?Id=54D6E094A91AF8EC&Form=DispTab&JS=Y&Action=Accept;
[22] Emergency department visits. MEPS Table 6: Emergency Room Services-Median and Mean Expenses per Person With Expense and Distribution of Expenses by Source of Payment: United States, 2013
[23] Facility And SBD Expenses, median $850/visit; Ambulatory visits: Davis K, Carper K. Use and Expenses for Office-Based Physician Visits by Specialty, 2009: Estimates for the US Civilian Noninstitutionalized Population. Rockville, Md.: Agency for Healthcare Research and Quality, Statistical Brief. 2012 Aug; 381. Average expense in 2009 was $218.
[24] Bureau of Labor Statistics Economic News Release: Table B-3 Average hourly and weekly earnings of all employees on private nonfarm payrolls by industry sector, seasonally adjusted. http://www.bls.gov/news.release/empsit.t19.htm. Table 6. Employer costs per hour worked for employee compensation and costs as a percent of total compensation: Private industry workers, by major industry group, June 2016 http://www.bls.gov/news.release/ecec.t06.htm The agricultural wage was derived from Fayer SD. Agriculture: occupational employment and wages. Monthly Lab. Rev. 2014;137:1. http://www.bls.gov/opub/mlr/2014/article/agriculture-occupational-employment-and-wages.htm.

daily wage. Actual costs of missed work may be underestimates for employers who must cover missed work with substitutes or overestimates due to widespread use of Paid Time Off (PTO).

Cost of Turn-over, Replacement and Other Problems

Substance use is associated with a number of hazardous and costly social consequences that can have negative impacts in the workplace that can be derived from NSDUH responses. Studies place the average cost to employers of recruiting and training replacement workers at 21 percent.[25, 26] Replacement and retraining costs are greater for workers with more education and training, and lower for workers paid less and with fewer skills. Employers' turn-over costs are computed from the difference in rates of one year turn-over of workers in an industry sector with and without a substance use disorder and the average costs of replacement in that sector.

Substance use is associated with other problems that can impact employees' productivity and safety which have not been monetized. These include inattention while at work (referred to as "presenteeism"), accidents and injuries associated with driving while intoxicated, and workplace and domestic violence. Substance use may also be associated with increased risk of serious psychological distress, episodes of depression and anxiety, and tobacco dependence.

[25] Boushey, H. & Glynn, S.J. (2012). There are significant business costs to replacing employees. Center for American Progress. Retrieved 9 Dec 2016 https://cdn.americanprogress.org/wp-content/uploads/2012/11/16084443/CostofTurnover0815.pdf.

[26] Tracey JB, Hinkin TR. (2008). Contextual factors and cost profiles associated with employee turnover. Cornell Hospitality Quarterly 49(1): 12-27.

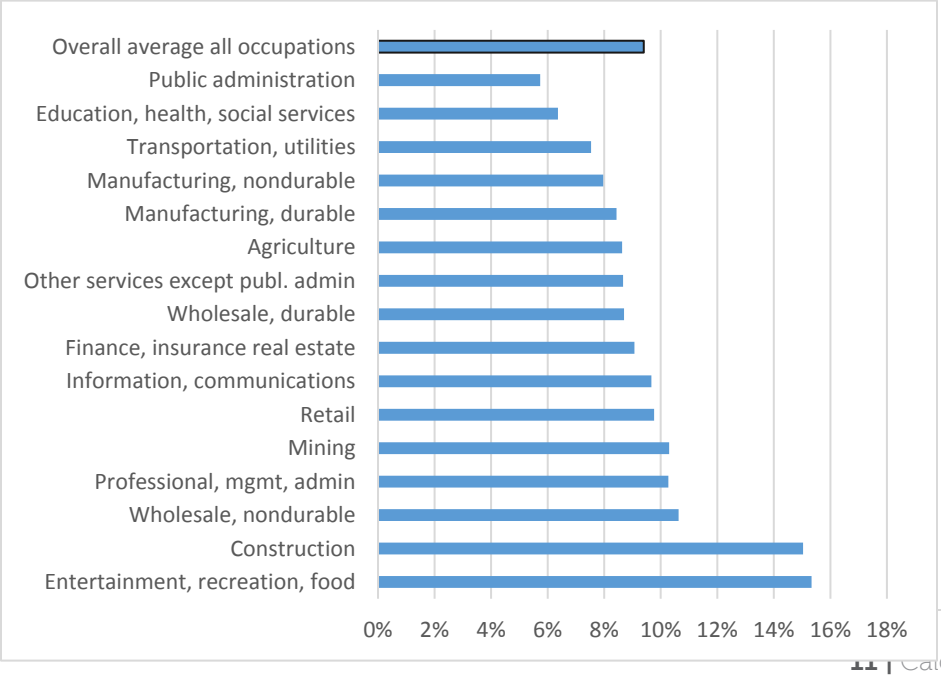
Results

Prevalence of Prescription Pain Medication, Alcohol and Substance Use Disorders by Industry Sector

Industries with younger, male-dominated workforces, and those that have easy access to alcohol have high rates of substance use and alcohol use disorders. Construction, entertainment, recreation, and food service businesses have nearly twice the rates of substance use and alcohol use disorders as the national average (15% compared to 8.6% nationally for substance use disorders, 12% compared to 7.5% nationally for alcohol use disorders). Pain medication misuse and pain medication use disorders follow a similar pattern, with two to three times higher rates of pain medication problems in these industries than the nation's workforce in general. By contrast, older and more female workforces in public administration, education, and health and social services experience about two-thirds the national rates of substance use.

The figure and Table 4 below show rates of substance use disorders by industry.

Table 4. Rates of substance use disorders are highest in construction and entertainment industries.



Although alcohol is the primary contributor to overall rates of substance use disorders, the addictiveness and lethality of pain medication use disorders make this an important labor force concern. Generally, the industries with more alcohol use disorders in their labor forces have more illicit drug, pain medication, and marijuana use disorders. Industries with relatively low rates of alcohol use disorders have correspondingly low rates of other drugs. The prevalence of pain medication and heroin use disorders is low among working adults, only 0.8% in 2012, 2013, and 2014. Entertainment, recreation and food service stand out with double the national workforce average of opioid use disorders (1.6% vs 0.8%). Construction, mining, and other services have higher than average opioid use disorders. Marijuana use disorders are relatively uncommon within the labor force. Overall, 1.5% of employees have a marijuana use disorder, but again, workers in the entertainment, recreation, hospitality, and food service sector have rates much higher than average (3.5%), as do construction (2.3%) and retail (2.1%). Mining (0.1%), public administration (0.5%), and durable goods manufacturing (0.6%) have lower rates.

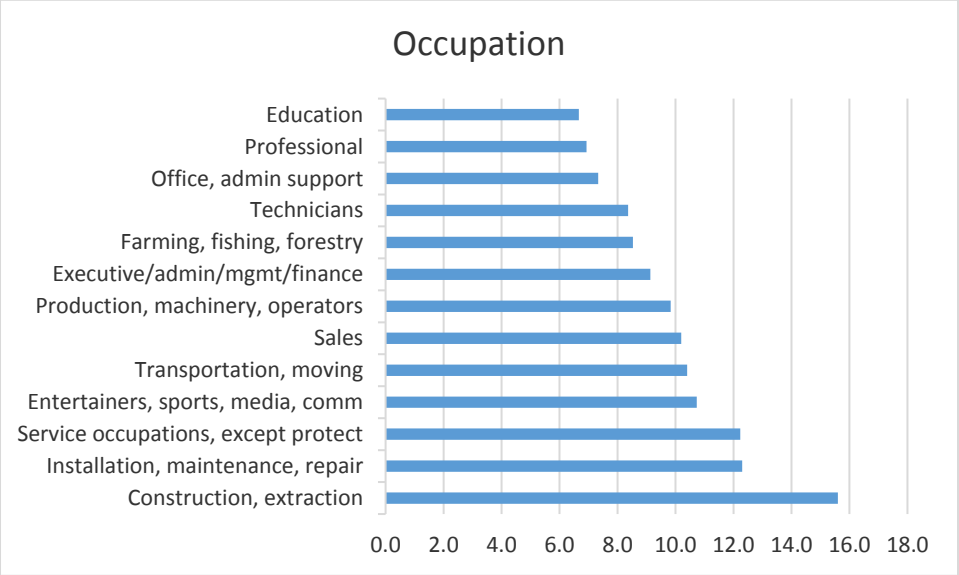
Table 5. Rates of substance use disorders vary by industry.

	Any SUD	Alcohol use disorder	Illicit drug use disorder	Pain med and opioid use disorder	Marijuana use disorder
Entertainment, recreation, food	15.3	12.1	5.7	1.6	3.5
Construction	15.0	12.4	4.4	1.3	2.3
Wholesale, nondurable	10.6	9.4	2.4	0.7	1.2
Professional, mgmt., admin	10.3	8.6	2.7	0.9	1.6
Mining	10.3	9.6	1.0	1.0	0.1
Retail	9.8	7.9	3.3	0.9	2.1
Information, communications	9.7	8.2	2.3	0.6	1.4
Finance, insurance real estate	9.1	8.1	1.5	0.3	1.0
Wholesale, durable	8.7	8.1	1.3	0.4	0.9
Other services except publ. admin	8.7	7.1	2.5	1.0	1.6
Agriculture	8.6	7.5	1.7	0.4	1.2
Manufacturing, durable	8.4	7.5	1.5	0.8	0.6
Manufacturing, nondurable	8.0	6.7	2.1	0.6	1.1
Transportation, utilities	7.5	6.6	1.7	0.6	0.9
Education, health, social services	6.4	5.4	1.5	0.5	1.0
Public administration	5.7	5.0	0.9	0.5	0.5
Overall average all occupations	9.4	7.9	2.5	0.8	1.5

Occupation

Occupations track closely the industry-sector patterns seen above. Construction workers, miners, service workers, and entertainment, recreation, and food service workers have twice the rates of educators, professional, and office and administrative support workers. This pattern repeats for illicit drug use, alcohol use, and pain medication use disorders.

Table 6. Occupational rates are similar to industry-sector patterns.



Workplace Absenteeism

Employees with substance use disorders miss substantially more work days than other employees. The typical worker misses an average of 10.5 days annually for illness, injury, or reasons other than vacation and holidays. Workers with substance use disorders miss nearly 50% more days than their peers, missing 14.8 days a year. Workers with pain medication use disorders miss nearly three times as much work as their peers -- 29 days. Most of these extra days of missed work are associated with illness and injury, more than 22 days annually. Workers in recovery, who report receiving substance use treatment in the past and who have not had a substance use disorder within the last 12 months, miss the fewest days of any group. They are less likely than even the

general workforce to miss work days (9.5 days for workers in recovery and 10.5 days for other workers).

Table 7 below also shows differences in job turnover between the average worker and workers with substance use disorders. One-fourth of currently employed workers report having more than one employer in the previous year. Compared to the average worker, employees with a substance use disorder are much more likely to report having more than one employer: 36% among workers with any SUD, 42% among workers with a prescription pain use disorder. On average, workers in recovery are the least likely group to leave their employers. Their turnover rate is lower than even workers with no current or prior substance use issues (21% and 25%, respectively).

Table 7. Workers in recovery have the lowest turnover rates.

	General work force	Any SUD	Alcohol use disorder	Illicit drug use disorder	Pain med use disorder	Marijuana use disorder	In recovery
Missed work days for injury, illness past year	8.4	10.2	9.4	13.0	22.2	10.6	8.3
Missed work days for other reasons past year	2.1	4.7	4.7	5.4	6.8	4.8	1.2
Total missed work days past year	10.5	14.8	14.1	18.4	29.0	15.4	9.5
Worked for more than one employer in last year (%)	25	36	36	42	42	45	23

Health Care Utilization

Although employees with substance use disorders use slightly more health care than workers with no current or past substance use, the big difference between groups, as shown in Table 8, is that workers who have a pain medication use disorder use health care services much more than their peers.

Hospital use: People with pain medication use disorders are more than twice as likely as their peers to have been hospitalized in the previous 12 months and, when hospitalized, stay more than twice as long. No other substance-using group, including workers who misused pain medications, show so great a difference in hospital use. Workers in recovery have the lowest hospital use.

Table 8. People with a pain medication use disorder have the highest rates of healthcare utilization.

	General work force	Any SUD	Alcohol use disorder	Illicit drug use disorder	Pain med use disorder	Marijuana use disorder	In recovery
Hospitalized overnight last year (%)	7.4	7.9	7.9	9.5	17.0	8.1	7.3
Hospital nights per person last year	0.3	0.3	0.3	0.5	0.6	0.5	0.2
Emergency room visits last year	0.4	0.6	0.5	1.0	2.0	0.8	0.4
Outpatient visits last year	2.6	2.3	2.4	2.7	3.9	2.5	2.6

Patterns of hospital use of workers' families is similar. People with a current or past-year SUD were more likely to be hospitalized and stay longer than either individuals with no current SUD or those in recovery (no current or past year SUD but substance use treatment at some point in their lives). The average per person number of hospital nights in the previous year were 0.65 nights for individuals with a current SUD, 0.51 for individuals in recovery, and 0.34 nights for individuals with no SUD and no prior SUD treatment.

Emergency room use: Workers with pain medication use disorders use hospital emergency services (ED) twice a year, more than four times as often as workers with no substance use disorders, or workers in recovery. Workers with an illicit drug use disorder or who misuse pain medications had twice the rate of ED use as their peers. Family members with an SUD also use more emergency services than individuals with no SUDs (0.81 visits and 0.55 visits respectively), but only slightly more than individuals in recovery (0.77 visits).

Ambulatory medical care: Workers with a pain medication disorder are outliers. They report an average of nearly four primary care visits annually. All other groups clustered around 2.5 visits annually. Family members in recovery used more outpatient services (3.2 annually) than the general population (2.8) or those with an SUD (2.7). People who are in recovery are older, with only 10% younger than 25. Comparatively, this age group represents 27% of people with no SUD and 35% of people with an SUD.

Comorbid Substance Use

Employees who have a substance use disorder often are dependent on more than one drug. Four in 10 workers who had an illicit drug use disorder had comorbid alcohol use disorder. Sixty percent had a comorbid marijuana use disorder, and 28% had a pain medication use disorder. Similarly, 38% of employees with pain medication use disorders have alcohol use disorders, and 16% had marijuana use disorders. A somewhat similar pattern of comorbid substance use is seen among employees with marijuana use disorders. Alcohol use exhibits a different pattern: only 13% had an illicit drug use disorder, 3% were dependent on pain medications, and 8% were dependent on marijuana.

Serious Psychological Distress, Depression, and Anxiety

The NSDUH interview uses a six-item scale to measure respondents' psychological distress in the prior 12 months. The symptoms assessed include: feeling hopeless, feeling nervous, feeling restless or fidgety, feeling sad or depressed, feeling everything was an effort, and feeling worthless. Table 9 highlights the sharp difference between the general workforce and workers in recovery, on the one hand, and workers with current substance use disorders, especially workers with pain medication use disorders. Fewer than 4 in 100 workers in the general labor force report symptoms of serious psychological distress. Only 3 in 100 workers in recovery report serious distress. By contrast, workers with pain medication use disorders report serious distress seven times more frequently (28%). Although workers with any substance use disorder and those with alcohol or illicit drug use disorder were more likely to report serious distress than their peers with no current substance use disorder, it is the pain medication group that stands out. A similar pattern, though not as extreme, can be seen in the prevalence of major depressive episodes and significant anxiety in the year prior to the interview. Among the general workforce and among workers in recovery, rates of depression and anxiety are similar and low. Among workers with substance use disorders, and especially among workers with pain medication use disorders, depression and anxiety are much more common.

Table 9. Rates of depression and anxiety are highest among workers with a pain medication use disorder.

	General work force	Any SUD	Alcohol use disorder	Illicit drug use disorder	Pain med use disorder	In recovery
Serious psychological distress past year %	4	12	11	20	28	3
Anxiety disorder past year %	5	11	11	14	20	6
Depression past year %	6	11	11	15	22	7

Smoking

Workers with substance use disorders are much more likely than their peers to smoke tobacco and to be dependent on nicotine. Overall, fewer than one in four workers report smoking a cigarette in the last 30 days. But half of all employees who have a substance use disorder, and about two thirds of workers with a pain medication disorder, marijuana or illicit drug use disorder, reported smoking in the last 30 days. Twice as many employees with a substance use disorder are dependent on nicotine than are their peers: 25% vs. 12%. Nearly half (48%) of workers with a pain medication use disorder are nicotine-dependent. Workers in recovery, those who received substance use treatment at some point in their lives but who have not been substance-dependent in the last 12 months, are less likely to smoke or to be nicotine-dependent than workers with a substance use disorder and below workers who have never had a substance use disorder.

Table 10. Workers with any substance use disorder are more likely to smoke than the general workforce.

	General work force	Any SUD	Alcohol use disorder	Illicit drug use disorder	Pain med use disorder	Marijuana use disorder	In recovery
Percent cigarette use - past 30 days use (%)	23	49	44	66	68	62	19
Percent nicotine dependence past year (%)	12	25	22	47	48	32	10

Driving Under the Influence

In 2014, driving while under the influence of alcohol or other drugs was a factor in the deaths of 9,967 people, representing nearly one third (31%) of all traffic-related fatalities in the U.S. The 1.3 million arrests for impaired driving every year may represent only about 1% of the actual alcohol and drug impaired driving incidents.[27, 28, 29] The National Highway Traffic Safety Administration (NHTSA) estimates that DUI costs the United States more than $44 billion each year in prosecution, higher insurance rates, higher taxes, medical claims, and property damage.[30]

The NSDUH surveys find that 16% of working adults report driving while under the influence of alcohol or drugs at least once during the last year. Among workers with an alcohol use disorder, almost two thirds (64%) report drinking and driving. Comparable rates of impaired driving are reported by workers with a drug use disorder (61%), and those with a pain medication use disorder (54%). Only 11% of workers in recovery reported driving under the influence, the lowest rate of any group studied.

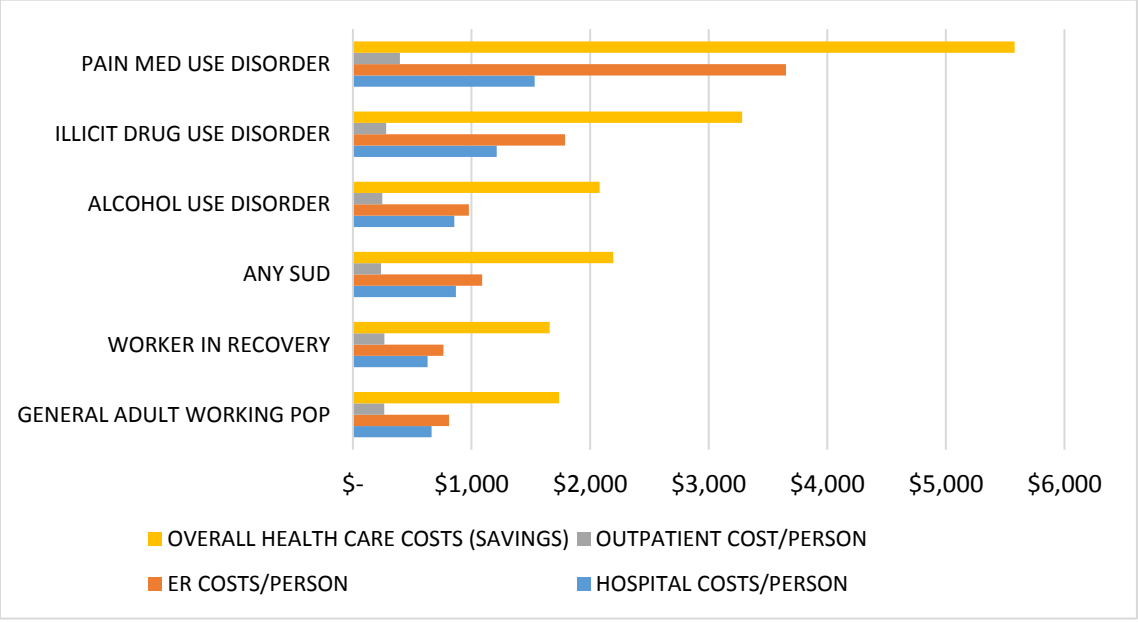
[27] National Highway Traffic Safety Administration. (2015). Traffic safety facts 2014 data: Alcohol impaired driving. (DOT HS 812 231). Washington, DC: U.S. Department of Transportation.
Compton, R. P., & Berning, A. (2015). Drug and alcohol crash risk. (DOT HS 812 117). Washington, DC: National Highway Traffic Safety Administration.
[28] National Highway Traffic Safety Administration (NHTSA). (2014).
[29] Federal Bureau of Investigation (FBI). (2012). Estimated number of arrests: United States, 2012 Crime in the United States 2012: Uniform crime reports.
[30] Blincoe, L., Miller, T. R., Zaloshnja, E., & Lawrence, B. A. (2015). The economic and societal impact of motor vehicle crashes, 2010 (Revised). (DOT HS 812 013). Washington, DC: National Highway Traffic Safety Administration.

Costs of Pain Medication Misuse and Substance Use Disorders to Business

Cost of excess health care use: As reflected in NSDUH respondents' recall of health care use in the previous 12 months, the cost of an employee's health care in 2014 was $1,741. This figure under-estimates costs, as it does not include the costs of medications or lab tests. A worker with a substance use disorder used health care costing $2,198. The greater average costs for workers with an SUD is primarily from greater emergency department use. Workers with a pain medication use disorder cost more than twice that much, at $5,586. The difference is primarily associated with emergency department use four times that of workers with no substance use disorders and twice the rate of workers with any other substance use condition.

Health care costs of workers in recovery are nearly identical with those of workers with no current or past substance use conditions. Based on self-reported use, workers in recovery had an average annual cost only $80 more than their peers who have never had a substance use disorder.

Table 11. Per capita health care costs are highest for workers with a pain medication use disorder.



The pattern of health care costs of family members are similar to those of workers. Annual hospital, emergency, and outpatient costs for a person with an SUD were $3,440, for a person in recovery, $3,071, and for an individual with no SUD, $2,173.

Employers contribute an average of 82% of the premium for a single employee and 71% for family coverage. The table below shows the amount that the average employer subsidizes through premium support the health care costs for an individual or a family member with no substance use disorder, any substance use disorder, or in recovery. Workers and family members who have a current substance use disorder use consistently use more services and cost more than individuals with no substance use disorder. Health care use and health care costs subsidized by employers for workers and family members who are in recovery are intermediate between these two groups.

Table 12.0

	Employer's cost (71% premium for family)	Employer's costs (82% premium for individual)
Current SUD	$2,442	$1,802
In Recovery	$2,180	$1,493
No Current SUD	$1,543	$1,428

Cost of missed work: Employers absorb significant expenses from missed work. The table below illustrates the estimated costs of missed days in each of the industry sectors. Table 13 below shows employers' extra costs of missed work by workers with a substance use disorder over and above the average amount of work missed by workers in each industry sector. Actual costs of missed days will vary based on differences in wages and PTO reimbursement policies.

Table 13. Costs of missed work vary by substance use disorder and by industry.

	Extra annual cost of missed work per person with an SUD, $	Extra annual cost of missed work per person with a pain medication use disorder, $
Agriculture	187	1,668
Mining	881	(764)[a]
Construction	1,040	455
Manufacturing: Durable goods	1,399	14,830
Manufacturing Nondurable goods	1,692	1,677
Transportation and warehousing	383	3,125
Information, communications	3,941	27,173
Wholesale durable	(893)[a]	2,468
Wholesale nondurable	886	2,463
Retail trade	1,284	225
Finance, insurance, real estate	1,169	2,373
Professional, mgmt., admin	2,604	6,057
Education, health, social services	887	5,062
Entertainment, recreation, food	795	2,490
Public administration	1,406	(162)[a]
Other services	945	2,417

a. Negative numbers are likely associated with small numbers of workers in some categories. Mining represents 0.6% of the NSDUH employed respondents, so a small number of workers with an SUD in that sector with unusually high or low absenteeism may skew responses.

For the calculator to estimate employers' costs of missed work, the state- and industry sector-adjusted substance use disorder prevalence rates are multiplied by the number of employees, the difference in the number of work days missed annually, and the August 2016 Bureau of Labor Statistics fully loaded hourly wage for that sector.

Turnover costs: Each year, a quarter of workers report having more than one employer. For some industries, such as entertainment, lodging, hospitality, and food service, turnover is higher than average (36%), in others such as public administration (18%) job turnover is rarer. Workers with an active substance use disorder had much higher rates than the general norm (36%), and some sectors were considerably above that. Table 14 shows three-year average turnover rates for all workers and for workers with a substance use disorder by industry sector. Studies place the average cost to employers of recruiting and training replacement workers at 21 percent.[31, 32] Cost are greater for workers with greater education and training, and lower for workers paid less and with fewer skills. The column on the far right of table 13.1 below shows the extra costs employers bear for turnover and replacement for each employee with an untreated substance use disorder. In sectors with high average salaries, such as information and communications, each worker with an untreated substance use disorder costs an employer more than $4,000 annually as a result of the greater risk of their leaving their jobs within that year compared with the per capital employer costs for turnover for each industry sector. Compare that cost to the lower industry wages and smaller turn-over differential between the general workforce and workers with a SUD seen in agriculture. There, the extra per capita cost of untreated substance use disorders is $512 annually.

Table 14. Turnover costs are highest in higher-wage and higher-skilled industries.

	Average sector turnover rate (%)	Turnover rate for workers with SUDs (%)	Workers In recovery (%)	Average per capita turnover cost[a] ($)	Per capita turnover cost if any SUD ($)	Per capita excess turnover cost if SUD ($)
Agriculture	20	27	20	1,535	2,046	512
Mining	27	41	27	5,044	7,597	2,553
Construction	27	32	26	4,440	5,317	877
Manufacturing, nondurable	19	32	19	3,085	5,052	1,968
Manufacturing, durable	19	28	18	2,601	3,947	1,347
Transportation, utilities	21	31	21	2,871	4,284	1,413
Information, communications	24	43	23	5,068	9,137	4,069

[31] Boushey, H. & Glynn, S.J. (2012). There are significant business costs to replacing employees. Center for American Progress. Retrieved 9 Dec 2016 https://cdn.americanprogress.org/wp-content/uploads/2012/11/16084443/CostofTurnover0815.pdf.

[32] Tracey JB, Hinkin TR. (2008). Contextual factors and cost profiles associated with employee turnover. Cornell Hospitality Quarterly 49(1): 12-27.

Wholesale, durable	21	34	21	3,681	5,924	2,243

Table 14 (Continued)

	Average sector turnover rate (%)	Turnover rate for workers with SUDs (%)	Workers In recovery (%)	Average per capita turnover cost[a] ($)	Per capita turnover cost if any SUD ($)	Per capita excess turnover cost if SUD ($)
Wholesale, nondurable	20	26	21	2,125	2,682	557
Retail	26	39	26	2,682	4,075	1,393
Finance, insurance real estate	21	28	20	3,974	5,299	1,325
Professional, mgmt, admin	25	32	25	4,506	5,767	1,262
Education, health, social services	25	36	25	3,762	5,417	1,655
Entertainment, recreation, food	36	49	36	3,167	4,271	1,104
Public administration	18	25	18	2,759	3,711	953
Other services except publ. admin	26	44	27	3,490	5,862	2,372

a. Average turnover, recruitment, replacement and training costs estimated at 21.4% of annual salary

Overall Costs of Untreated SUDs: Employers' costs for untreated substance use disorders are substantial. Table 15 shows the costs for each employee who has an SUD when excess health care use, absenteeism, and turn-over are added together. The second column shows how much untreated substance use costs employers when these excess costs for untreated substance use are spread across every person employed. . Information and communications, and professional services bear the highest costs. But other sectors with high rates of SUDs in their workforce, like construction and entertainment, lodging, hospitality, and food service, are exposed to significant costs because SUDs are so common.

Table 15 Excess costs are highest in information/communications and mining.

	Prevalence of SUD (%)	Excess cost for each employee with a SUD ($)	Cost of SUD per employees ($)
Agriculture	8.6	2,689	232
Mining	10.3	8,934	920
Construction	15.0	6,813	1,024
Manufacturing, nondurable	8.0	6,907	550
Manufacturing, durable	8.4	6,096	514
Transportation, utilities	7.5	5,123	385
Information, communications	9.7	13,534	1,308
Wholesale, durable	7.4	5,487	477
Wholesale, nondurable	10.6	4,024	427
Retail	9.8	5,815	568
Finance, insurance real estate	9.1	6,925	627
Professional, mgmt, admin	10.3	8,827	906
Education, health, social services	6.4	6,760	430
Entertainment, recreation, food	15.3	5,523	846
Public administration	5.7	5,573	319
Other services except publ. admin	8.7	7,264	629
Overall average	9.4	6,643	624

Greater use of health care by family members who have an SUD adds an extra $1,267 annually for each person with an untreated SUD, about $900 of which an employer covers through family premium support. SUDs among family members adds roughly $87 to employers' costs for each and every worker.

Savings to Business when Workers Recover

Based on the responses across the three NSDUH surveys of 7,988 employees who reported past substance use treatment and who had no signs of a substance use disorder in the previous 12 months, we can estimate the annual per capita employer costs avoided in reduced health care, absenteeism, and turn-over/replacement for each worker in recovery from substance use disorders. The average health care costs of a worker in recovery is $536 per year less than a co-worker with a substance use disorder are $536. A family member in recovery from addiction has $262 lower health care costs per year than a family member with an SUD. .

Table 16.1. Healthcare costs for workers in recovery are lower than costs for the general population.

	General adult working pop ($)	Any SUD ($)	Worker in recovery ($)
Per capita cost of hospitalization	663	868	629
Per person cost of OP visits	264	236	265
per person cost of ED visits	810	1,089	763
Overall health care costs	1,741	2,197	1,661

Workers in recovery stay with one employer at nearly identical rates as other workers in that sector. The difference in the percentage of workers who had only one employer for the previous 12 months was one percent or less in every industry. Comparing the costs of turn-over and replacement of workers with a substance use disorder and workers in recovery, the savings for employers are substantial in every sector (Table 16.2 below).

Table 16.2. Lower turnover rates can accrue large savings, which vary by industry.

Industry	Per capita savings ($)
Agriculture	512
Mining	2,553
Construction	877
Manufacturing, nondurable	1,968
Manufacturing, durable	1,347
Transportation, utilities	1,413
Information, communications	4,069
Wholesale, durable	2,243
Wholesale, nondurable	557
Retail	1,393
Finance, insurance real estate	1,325
Professional, mgmt, admin	1,262
Education, health, social services	1,655
Entertainment, recreation, food	1,104
Public administration	953
Other services except publ. admin	2,372

Workers in recovery miss work much less than workers with a substance use disorder. They even miss less work than workers who have never had a substance use problem. They miss work a week less than workers with an SUD, and a day less than worker who have never had a substance use disorder. Table 16.3 shows savings employers benefit from reduced absenteeism for each worker in recovery, when compared with absence rates by workers in that sector with a substance use disorder.

Table 16.3. Absenteeism rates for workers in recovery are even lower than rates among people without an SUD.

	Savings for each worker in recovery ($)
Agriculture	90
Mining	422
Construction	499
Manufacturing: Durable goods	671
Manufacturing Nondurable goods	812
Transportation and warehousing	184
Information, communications	1,891
Wholesale durable	(428)
Wholesale nondurable	425
Retail trade	616
Finance, insurance, real estate	561
Professional, mgmt, admin	1,250
Education, health, social services	425
Entertainment, recreation, food	381
Public administration	674
Other services	453

Employers can save a significant amount if they can assist their employees to receive treatment for a substance use disorder. The table below demonstrates that the one year savings for each employee who recovers from a substance use disorder is more than $3,200. For some industries, the savings are significantly higher: more than $8,400 for each employee in recovery in information and communications industries, and more than $4,300 in professional, management, and administrative industries.

Table 16.4.

Industry sector	Savings per worker in recovery ($)
Agriculture	1,155
Mining	3,890
Construction	2,373
Manufacturing, nondurable	3,823
Manufacturing, durable	3,495
Transportation, utilities	2,252
Information, communications	8,466
Wholesale, durable	1,806
Wholesale, nondurable	1,900
Retail	3,134
Finance, insurance real estate	2,950
Professional, mgmt., admin	4,322
Education, health, social services	2,998
Entertainment, recreation, food	2,356
Public administration	2,815
Other services except publ. admin	3,773
Overall average all occupations	3,219

Conclusion

The Calculator gives a simple estimate of the financial toll faced by individual businesses, illuminating an area with significant potential for cost reduction and improved productivity. The Calculator provides employers tools to identify opportunities for health and productivity savings while also improving the health of employees and their families.