REPORT

The opioid crisis in America's workforce

castlight™ HEALTH

TABLE OF CONTENTS

According to American Society of Addiction Medicine (ASAM), **opioid abuse costs employers approximately $10 billion** from absenteeism and presenteeism alone. Despite the breadth and seriousness of this crisis, America's employers lack a true understanding of how it impacts individuals in the workforce and their families. Castlight developed this first-of-its-kind study on opioid abuse by examining **de-identified and anonymous** health data reporting from Americans insured by large employers who use our product.

THE OPIOID CRISIS IN AMERICA'S WORKFORCE

The use and abuse of prescription opioids continues to be a challenging and costly crisis for the U.S. The facts underscore the severity of this crisis:

- Nearly 2 million Americans are abusing prescription opioids[1]
- 16,000 people die every year from prescription opioid overdoses[2]
- Sales of opioid prescriptions in the U.S. nearly quadrupled from 1999 to 2010[3]
- 259 million opioid prescriptions were written in 2012, enough for every American adult to have their own bottle of pills[4]
- Opioid abuse costs the U.S. economy nearly $56 billion[5]
- Opioid abuse costs employers approximately $10 billion from absenteeism and presenteeism alone[6]

Simply put, the prescription opioid crisis is getting worse, not better. The personal toll that opioid abuse takes on individuals, their friends, and their families is alarming. On top of that, the financial cost of opioid use impacts not just these individuals, but also their communities and their employers.

In response to this growing crisis, states have enacted legislation to limit the duration of first-time opioid prescriptions, expanded access to naloxone (a drug used to treat the effects of an overdose), and enhanced Prescription Drug Monitoring Programs (PDMPs) that monitor for suspected abuse. At a federal level, President Obama proposed a $1.1 billion investment to fight opioid addiction[7] and the U.S. Senate passed bipartisan legislation along with the Comprehensive Addiction and Recovery Act. In the healthcare industry, a number of key players, including pharmacy benefit managers (PBMs), are taking similar actions to address this urgent situation.

This crisis is also confronting the nation's employers, who insure about half of all Americans. According to the American Society of Addiction Medicine (ASAM), opioid abuse costs employers approximately $10 billion from absenteeism and presenteeism alone.[8] Despite the breadth and seriousness of this crisis, America's employers lack a true understanding of how opioid abuse impacts individuals in the workforce and their families.

For this report, Castlight Health conducted research on opioid abuse based on aggregated reporting from medical and pharmacy-based claims. These findings are inclusive of de-identified and anonymous health data reporting covering nearly 1 million Americans who use Castlight's health benefits platform, a subset of Castlight's broader user population. The study leverages Castlight's medical and pharmacy reporting over the five-year period from 2011-2015 to provide employers with a more accurate picture of opioid painkiller abuse in the workplace.

As the opioid crisis has grown, so has the amount of research and analysis on the topic. This particular analysis takes a population-based approach, focusing on Americans covered by large self-insured employers. Given Castlight Health's unique analytics capability, this study contains descriptive trends combining both cost and demographic trends. Unlike previous studies that use public data that is at least two years old, this study leverages more recent medical and pharmacy reporting. Furthermore, these findings are specific to workforce populations at large self-insured employers, providing a unique perspective from other studies on opioid abuse (e.g., that include general and non-working population data).

Note: In developing an unique definition of "opioid abuse," Castlight referenced the Pharmacy Quality Alliance's (PQA) 2015 measures on high dosage and multiple providers as a starting point.[9] Our unique abuse definition, specific to this analysis only, is defined as follows: An individual, without cancer and/or receiving palliative care, who received a greater than 90-day cumulative supply of opioids AND received an opioid prescription from four or more providers.

EXECUTIVE SUMMARY

Castlight Health conducted research on opioid abuse in the workplace to provide employers with a more accurate picture of the extent and depth of this ongoing crisis. Below is a summary of the key findings:

PRESCRIPTIONS

One out of every three (32%) opioid prescriptions is being abused.

MEDICAL SPENDING

Opioid abusers cost employers nearly **twice as much** in healthcare expenses on average than non-abusers.

AGE

Baby boomers are **four times more likely** to abuse opioids than Millennials.

MEDICAL MARIJUANA

States with medical marijuana laws have a **lower** opioid abuse rate than those that don't.

BEHAVIORAL HEALTH

Patients with a behavioral health diagnosis of any kind are **three times more likely** to abuse opioids than those without one.

PAIN

Opioid abusers have **twice as many** pain-related conditions as non-abusers.

INCOME

Individuals living in America's lowest income areas are **twice as likely** to abuse opioids as those living in the highest income areas.

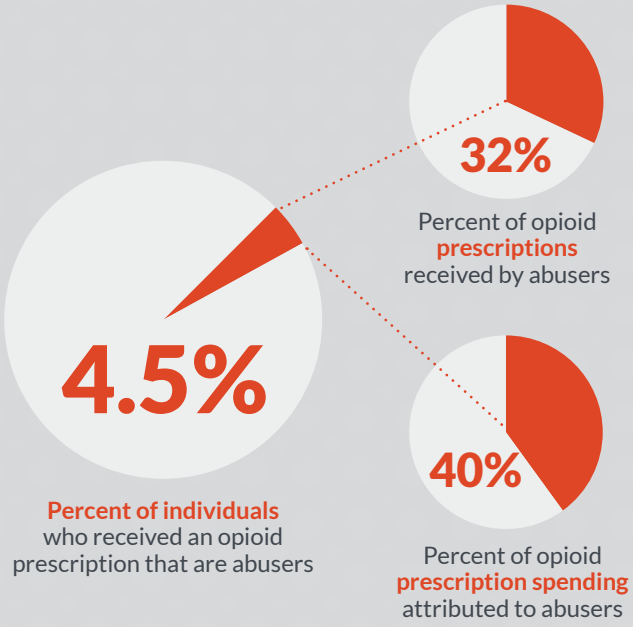
GEOGRAPHY

Opioid abusers are **more likely** to live in the **rural South** than in other regions.

Based on this research, Castlight recommends that employers take the following two actions: (1) Take a segmented and analytics-based approach to opioid abuse; and (2) guide employees to benefit programs to meet opioid abuse-related needs.

PRESCRIPTIONS

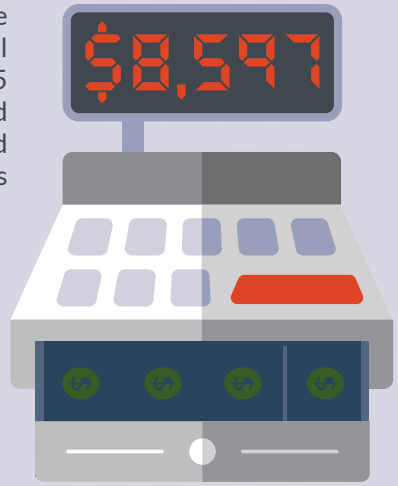
One out of every three (32%) opioid prescriptions is being abused. Moreover, 4.5% of individuals who have received an opioid prescription are opioid abusers, accounting for 32% of total opioid prescriptions and 40% of opioid prescription spending. This finding indicates that a disproportionate percentage of prescriptions for opioids are being prescribed to patients who abuse these medications. Furthermore, it illustrates that a relatively small number of individuals account for a large share of spending on opioid prescriptions.



MEDICAL SPENDING

Opioid abusers cost employers nearly twice as much ($19,450) in healthcare expenses on average annually as non-abusers ($10,853). Individuals who abused opioids had total 2015 medical costs that were, on average, $8,597 higher than those who did not. Based on Castlight's estimate, opioid abuse could be costing employers as much as $8 billion per year.[10] Considering that absenteeism and presenteeism tied to opioid misuse and abuse is costing employers an additional estimated $10 billion, this crisis represents a significant drain on America's employers.[11]

The difference in total medical costs for 2015 between opioid abusers and non-abusers



AGE

Baby boomers are four times as likely to abuse opioids as Millennials. 7.4% of Baby Boomers (aged 50 and over) with an opioid prescription were classified as opioid abusers whereas only 2.0% of Millennials (aged 20 to 34) with an opioid prescription were classified as opioid abusers.

Age group	Relative share of abusers (%)	Abuse rate (%)
0-19	0.3%	0.1%
20-24	1.9%	1.0%
25-29	3.3%	1.8%
30-34	6.2%	2.9%
35-39	7.8%	3.8%
40-44	10.2%	4.7%
45-49	13.0%	5.8%
50-54	**17.7%**	**7.1%**
55-59	**17.6%**	**7.4%**
60-64	**13.6%**	**7.3%**
65+	**8.4%**	**8.9%**

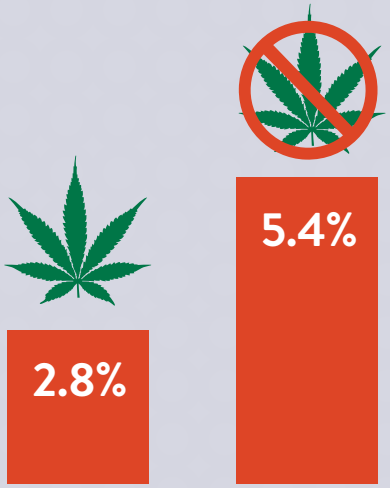
2.0% Millennials

7.4% Baby Boomers

Note: The abuse rate is defined as the share of prescription holders that abuse. Difference between each age group and youngest has a p-value<.001 except for 50-64 age group, which is statistically the same.

MEDICAL MARIJUANA

States with medical marijuana laws have a lower opioid abuse rate than those that do not. 5.4% of individuals with an opioid prescription who live in states prohibiting medical marijuana were opioid abusers. In contrast, 2.8% of individuals with an opioid prescription who live in states permitting medical marijuana were opioid abusers.



Percent of people abusing their opioid prescription in a state **permitting medical marijuana**

Percent of people abusing their opioid prescription in a state **prohibiting medical marijuana**

BEHAVIORAL HEALTH

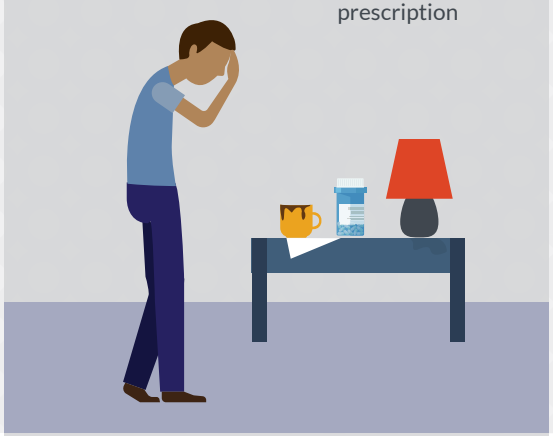
Individuals with a behavioral health diagnosis of any kind are three times more likely to abuse opioids than those without. 8.6% of individuals with at least one behavioral health diagnosis, such as anxiety or depression, abused opioids compared to 3.0% of individuals without a behavioral health diagnosis. This finding is striking given the prevalence of behavioral health issues in the workforce. 25% of employees have a diagnosable behavioral health condition; yet, 70% of impacted employees go untreated.

8.6%

Percent of people, **with** a behavioral health diagnosis, abusing their opioid prescription

3%

Percent of people, **without** a behavioral health diagnosis, abusing their opioid prescription



PAIN

Opioid abusers have twice as many pain-related conditions as non-abusers. Opioid abusers have 3.99 pain-related co-morbidities on average versus 1.78 co-morbidities for non-abusers. The three pain-related conditions most associated with opioid abuse are joint, neck, and abdominal pain. Individuals diagnosed with joint, neck, or abdominal pain-related conditions are more likely to abuse opioids, compared to other pain-related diagnoses, such as pelvic, dental/jaw, or non-fracture injury pain. Notably, back pain ranks fourth among these pain-related conditions, right below abdominal pain.

Opioid abuse by pain-related condition

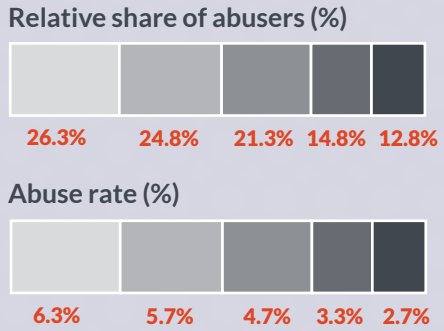
Pain-related condition	Relative share of abusers (%)	Abuse rate (%)
Joint pain	**43.4%**	**14.6%**
Neck pain	**34.2%**	**12.6%**
Abdominal pain	**16.1%**	**11.7%**
Back pain	**77.1%**	**11.3%**
Arthritis	28.9%	11.0%
Fracture	35.9%	9.4%
Nephrolithiasis (Kidney stones)	9.9%	9.4%
Cholelithiasis (Gallstones)	6.6%	9.0%
Sickle cell	0.4%	8.6%
Chest pain	62.4%	8.3%
Non-fracture injury	58.9%	7.1%
Dental/jaw pain	7.0%	7.0%
Pelvic	18.6%	6.4%

Note: The abuse rate is defined as the share of prescription holders that abuse.

INCOME

Individuals living in America's lowest income areas are twice as likely to abuse opioids as those living in the highest income areas. 6.3% of individuals with an opioid prescription living in the lowest income areas (with an average per capita income of $40,000 or less) abused opioids, compared to 2.7% of individuals with an opioid prescription living in the highest income areas (with an average per capita income of $85,000 or higher). Analysis was based on U.S. Census income data by zip code.

- Lowest (less than $40,000)
- Low ($40,000 - $48,000)
- Middle ($48,000 - $60,000)
- High ($60,000 - $84,000)
- Highest (greater than $84,000)



Note: The abuse rate is defined as the share of prescription holders that abuse. Income is captured at the zip code level. Trend and group differences are all significantly different with p-value <.001.

OPIOID ABUSERS

OPIOID ABUSERS ARE MORE LIKELY TO LIVE IN THE RURAL SOUTH.

22 out of the top 25 cities for opioid abuse rate are primarily rural and located in Southern states. Opioid abuse rates range from 11.6% of individuals in Wilmington, NC to 7.5% of individuals in Fort Smith, AR who received an opioid prescription. Alabama, Florida, North Carolina, Oklahoma, Tennessee, and Texas have multiple cities that are in the top 25 for opioid abuse rate. The three non-Southern cities in the top 25 are: Terre Haute, IN; Elmira, NY; and Jackson, MI.

BASED ON ABUSE RATE

TOP 25 CITIES

1.	**Wilmington, NC**	**>11.6%**
2.	Anniston, AL	11.6%
3.	Panama City, FL	11.5%
4.	Enid, OK	10.2%
5.	Hickory, NC	9.9%
6.	Pensacola, FL	9.8%
7.	Gadsden, AL	9.1%
8.	Montgomery, AL	8.8%
9.	Johnson City-Bristol,TN-VA	8.6%
10.	Texarkana, TX-AR	8.5%
11.	Tuscaloosa, AL	8.2%
12.	Jacksonville, NC	8.2%
13.	Amarillo, TX	8.1%
14.	Terre Haute, IN	8.1%
15.	Odessa, TX	8.0%
16.	Oklahoma City, OK	8.0%
17.	Longview, TX	8.0%
18.	Fayetteville, NC	7.9%
19.	Evansville-Henderson, IN-KY	7.8%
20.	Chattanooga, TN	7.7%
21.	Elmira, NY	7.7%
22.	Jackson, TN	7.7%
23.	Baton Rouge, LA	7.5%
24.	Jackson, MI	7.5%
25.	Fort Smith, AR	7.5%

OPIOID PRESCRIPTIONS ABUSED

THE PERCENTAGE OF OPIOID PRESCRIPTIONS ABUSED TENDS TO BE HIGHEST IN THE RURAL SOUTH.

When cities are ranked by percentage of opioid prescriptions abused, 17 out of the top 25 cities are still primarily rural and located in Southern states.

Alabama, Florida, North Carolina, Oklahoma, and Texas have multiple cities that are in the top 25 for percentage of opioid prescriptions abused.

The eight non-Southern cities in the top 25 are: Elmira, NY; Flagstaff, AZ; Pittsfield, MA; Bismarck, ND; Rochester, MN; Wausau, WI; Billings, MT; and Jackson, MI.

BASED ON PERCENTAGE OF PRESCRIPTIONS ABUSED

TOP 25 CITIES

1. Elmira, NY	**55.1%**	8. Gadsden, AL	48.1%	13. Johnson City-Bristol,TN-VA	46.7%	19. Texarkana, TX-AR	45.1%
2. Flagstaff, AZ	54.8%	9. Ft Pierce-Port St. Lucie, FL	47.4%	14. Anniston, AL	46.6%	20. Rochester, MN	45.0%
3. Enid, OK	54.7%	10. Amarillo, TX	47.1%	15. Fayetteville, NC	46.5%	21. Wausau, WI	44.6%
4. Wilmington, NC	53.8%	11. Pensacola, FL	47.0%	16. Hickory, NC	46.1%	22. Billings, MT	44.4%
5. Pittsfield, MA	53.6%	12. Oklahoma City, OK	46.8%	17. Baton Rouge, LA	46.1%	23. Killeen, TX	43.9%
6. Bismarck, ND	53.2%			18. Charlottesville, VA	45.6%	24. Jacksonville, FL	43.7%
7. Panama City, FL	51.6%					25. Jackson, MI	43.5%

THE PERSONAL PAIN OF PRESCRIPTION OPIOIDS

Employees and their families are hardest hit by the opioid crisis, whether they are suffering from addiction or dealing with the addiction of someone close to them. Recently, many of these personal stories have been brought to light. Here are just a few examples:

- A corporate saleswoman who made company presentations while high on Percodan
  Read the article here
- A daughter whose emotional letter about her opioid-addicted mom reached the Senate
  Read the article here
- A small-town Nebraska physician who has struggled daily to wean his chronic pain patients off opioids
  Read the article here

CONCLUSION

The opioid crisis touches every community in America and has a devastating impact on families, neighborhoods, and the workforce at large. While policymakers, public health officials, the healthcare industry, and many other stakeholders are engaged on this critical issue, American employers can also help address this crisis. Harnessing powerful data and analytics can help employers better understand their employees' needs as they relate to opioid use and abuse, and guide them to the right care at the right time.

KEY RECOMMENDATIONS

Castlight Health recommends that employers use this research to better understand the trends that could potentially lead to opioid abuse in their workforce populations. Specifically, Castlight encourages employers to do the following:

1. **Take a segmented and analytics-based approach to opioid abuse:** Employers should leverage data and analytics to identify opportunities to address health needs related to opioid abuse within their employee segments. Given its large sample size, this research illustrates how population-based analysis can enable employers, especially those with large and diverse workforces, to understand the scope of these health needs. For example, better insights can help a benefit leader identify where lower back pain or depression, two conditions closely associated with opioid abuse, are most prevalent in their company.

2. **Guide employees to benefit programs to meet opioid abuse-related needs:** Employers should leverage these insights to take both a critical and thoughtful look at how they can improve engagement and utilization across their benefit programs to guide their employees to better health decisions related to opioid use.

   Taking this approach will enable benefit leaders to guide employees dealing with opioid abuse-related needs to the right information and right care. For example, targeted educational content could help inform employees suffering from lower back pain that an opioid may not be the wisest option for them, or that physical therapy benefits are available. For many people, this type of information is critical. Many employees do not recognize the serious risk of addiction before they accept or fill an opioid prescription of any length.

   With this guidance, employers can help their employees easily find and access their health benefits, and avoid care choices that could require opioid use and lead to potentially abusive behavior.

By taking these two actions, employers can help engage and guide employees in making better health choices related to opioid use and abuse. Whether it's guiding an employee away from unnecessary back surgery (and the resulting opioid prescriptions) or offering programs that provide access to opioid abuse treatment, Castlight believes that data and analytics are part of the solution. A solution that will enable employers to effectively address opioid abuse head on, and confront the significant health, cost & productivity, and personal consequences linked to this crisis.

METHODOLOGY

The primary source of information for this descriptive analysis was medical and prescription claims reporting. Castlight de-identifies and aggregates the data used in this analysis in accordance with the Health Insurance Portability and Accountability Act (HIPAA).

For this analysis, opioid prescriptions were analyzed across broad demographic categories, which included age, income, and geography. In addition, Castlight looked at 2015 annual medical healthcare spending associated with this dataset. All analyses were restricted to de-identified and aggregated prescription opioid claims received between 2011 and 2015.

For the purposes of this analysis, opioid abuse was defined as meeting the following two conditions:

1. Receiving greater than a cumulative 90-day supply of opioids; AND
2. Receiving an opioid prescription from four or more providers over the five-year period between 2011 and 2015.

The main outcome of interest was the probability (likelihood) of opioid abuse conditional on receiving at least one opioid prescription (number of opioid abusers divided by the number of patients with an opioid prescription). Differences in this outcome were assessed by cost (average medical spending) and selected demographics. Statistical significance was assessed using linear probability models with robust standard errors.

Other relevant notes:

(1) Condition categories: Created using 3-digit ICD-9 diagnosis codes.

   a. Behavioral Health-related conditions: Created using the appropriate ICD-9 codes for this set of diagnoses (codes 290-319).

   b. Pain-related conditions: Created using ICD-9 categorization scheme from Agency for Healthcare Quality and Research's Clinical Classifications Software (CCS) coding.[12]

(2) Exclusion of cancer and convalescence/palliative care: In line with other academic studies, any prescription opioid claims associated with a cancer (neoplasm) diagnosis were excluded from this analysis. Prescription opioid claims associated with convalescence following chemotherapy, convalescence following radiotherapy, and palliative care were intended to be excluded; however, the number of associated claims was deemed too small to have a material effect on the results.

(3) Data privacy: Castlight is 100% compliant with all federal privacy laws governing the handling of employee data, including this analysis. Castlight strictly maintains complete employee confidentiality, and is fully compliant with all HIPAA security and administrative protocols governing protected health information (PHI):

   a. Employers that use our system never, under any circumstance, see individual employee data. The employee data is anonymous, aggregated, and all the employer ever sees is the size of the group of employees at risk for certain conditions.

   b. Castlight imposes minimums on the size of the group that can be displayed within the application.

REFERENCES

[1] Centers for Disease Control and Prevention (CDC). Prescription Opioid Data. Available at: **http://www.cdc.gov/drugoverdose/data/overdose.html.**

[2] CDC. Opioid Data Analysis (2013). Available at: **http://www.cdc.gov/drugoverdose/data/analysis.html.**

[3] CDC. Morbidity and Mortality Weekly Report. Available at: **http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6043a4.htm?s_cid=mm6043a4_w#fig2.**

[4] CDC. Opioid Painkiller Prescribing. Available at: **http://www.cdc.gov/vitalsigns/opioid-prescribing/.**

[5] American Society of Addiction Medicine (ASAM). Cited in: Workforce. "Pain Points." Available at: **http://www.workforce.com/articles/21855-pain-points.**

[6] Ibid.

[7] WhiteHouse.gov. FACT SHEET: President Obama Proposes $1.1 Billion in New Funding to Address the Prescription Opioid Abuse and Heroin Use Epidemic, 2016. Available at: **https://www.whitehouse.gov/the-press-office/2016/02/02/president-obama-proposes-11-billion-new-funding-address-prescription.**

[8] ASAM.

[9] Pharmacy Quality Alliance (PQA). Newly Endorsed PQA Performance Measures: Use of Opioids from Multiple Providers or at High Dosage in Persons without Cancer, 2015. Available at: **http://pqaalliance.org/images/uploads/files/OpioidMeasures_For%20website.pdf.**

[10] Estimate based on Castlight analysis.

[11] ASAM.

[12] Agency for Healthcare Quality and Research. Healthcare Cost and Utilization Project: Clinical Classifications Software (CCS) for ICD-9-CM. Available at: **http://www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp.**

ABOUT CASTLIGHT HEALTH

Castlight Health, Inc. (NYSE: CSLT) is a leading health benefits platform provider. Our mission is to empower people to make the best choices for their health and to help companies make the most of their health benefits. We offer a health benefits platform that engages employees to make better healthcare decisions and guide them to the right program, care, and provider. The platform also enables benefit leaders to communicate and measure their programs while driving employee engagement with targeted, relevant communications. Castlight has partnered with more than 190 customers, spanning millions of lives, to improve healthcare outcomes, lower costs, and increase benefits satisfaction.

For more information, visit castlighthealth.com and connect with us on Twitter and LinkedIn and Facebook.

For press inquires: Contact Jim Rivas
press@castlighthealth.com
415.829.1568

Castlight Health, Inc.
121 Spear Street, Suite 300
San Francisco, CA 94105

Tel: 844.865.6868
info@castlighthealth.com
castlighthealth.com