

Opioids in the Montana Workforce:

Exploring the Relationship Between Opioids and Workers' Industry & Occupation

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Understanding associated and contributing factors to opioid prescribing and opioid-related deaths is crucial to identifying which populations are most at risk and developing resources to assist those groups. One factor of interest is employment, including the industry in which an individual works or an individual's occupation. In general, industry describes an employer's overall function or service, while occupation is based on an individual worker's actual job duties. Previous analysis of Montana workers' compensation data has shown that, on average, injured workers in Montana utilize more opioid prescriptions per claim and consume higher average annual MME¹ per claim compared to injured workers utilizing opioids in other states (NCCI, 2018), but no information with regards to industry or occupation. The purpose of this report is to examine the association between opioid prescribing among injured workers and opioid-related overdose deaths in Montana by industry and occupation and to understand if the trends seen nationally and among other states are similar within the Montana workforce.

Multiple studies have already shown a relationship between opioids and a workers' industry and occupation. Using 1.4 million pain prescriptions across 391,054 workers' compensation claims and 27 states, researchers at the Workers' Compensation Research Institute found that workers employed in construction and mining industries were more likely than workers in other industries to receive an opioid prescription for pain. Construction and mining industries also had higher rates of receiving opioids on a longer-term basis, higher rates of opioid prescriptions with a morphine equivalent dose of ≥ 50 , and higher rates of having at least a 60-day supply of opioids within a 90-day period (Thumula et al., 2018). Montana workers' compensation claims were not included in this WCRI study. Using the National Survey on Drug Use and Health for survey years 2012 through 2014, which included over 77,000 employed participants, Gopleurd, et al. found that the prevalence of pain medication use disorder across all participants was 0.8%, and industry sectors with higher than average prevalence included workers employed in entertainment, recreation and food service industries (1.6%), followed by construction (1.3%), mining (1.0%), and other services (1.0%) (2017).

¹ Morphine Milligram Equivalents (MME) converts an opioid prescription to an equivalent daily dose of morphine by assigning each opioid a conversion factor. For more information visit: https://www.cdc.gov/drugoverdose/pdf/calculating_total_daily_dose-a.pdf

Other studies have focused on opioid-related overdose deaths. The Centers for Disease Control and Prevention analyzed data from the National Occupational Mortality Surveillance system across 21 states from 2007 through 2012 and found that construction occupations had the highest mortality rates for both prescription opioid-related overdose deaths and for heroin-related overdose deaths. Other occupations with high prescription opioid-related overdose deaths included mining, oil and gas extraction, and health care practitioners (Morano et al., 2018). Montana was also not included in this study. At the state level, Massachusetts Department of Public Health found that both the construction industry sector and construction and extraction occupations had significantly higher rates of opioid-related overdose deaths compared to other industries and occupations (Hawkins et al., 2018). Similarly, in Ohio, data from the Ohio Department of Health showed that construction workers were seven times more likely to experience an opioid-related overdose death (Dissell, 2017).

This report utilizes two primary sources of data:

- Montana workers' compensation data from the National Council on Compensation Insurance (NCCI)
- Death certificate data from the Montana Department of Public Health and Human Services (DPHHS)

Since both data sources use different coding systems, each are analyzed independently, and the remainder of the report is separated by **Injured Worker Opioid Prescribing in Workers' Compensation** and **Opioid-Related Overdose Deaths**. For both sections, the focus is to identify industries and occupations associated with opioids and the workforce.



Injured Worker Opioid Prescribing in Workers' Compensation

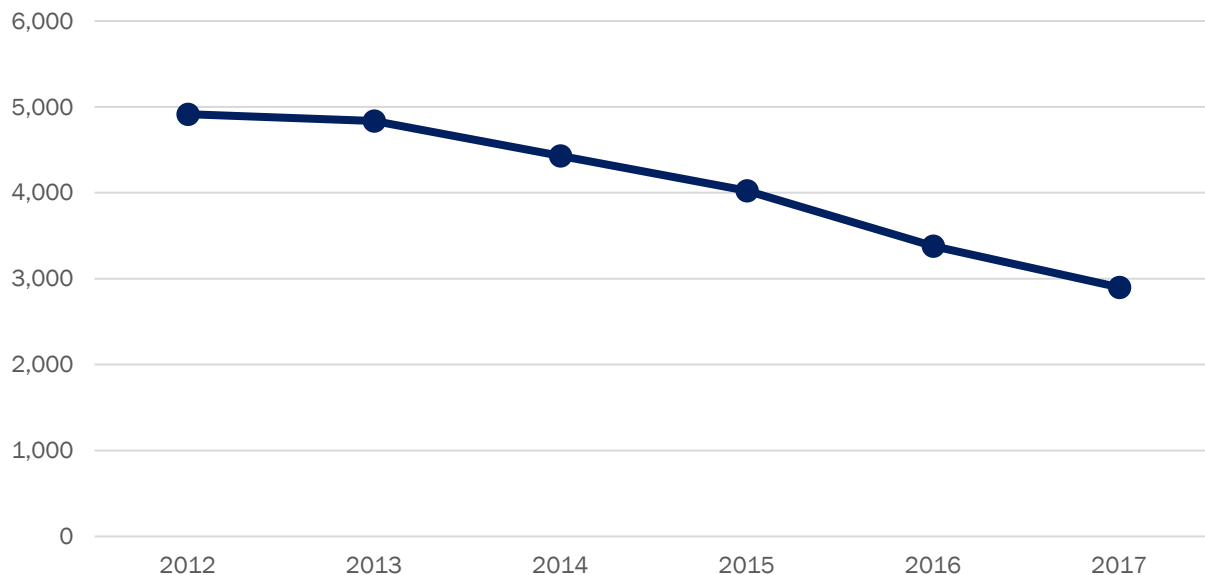
Data Overview

To investigate injured worker opioid prescribing by industry and occupation in workers' compensation, we used data from the National Council on Compensation Insurance (NCCI). As the workers' compensation rate-setting organization for Montana, NCCI receives workers' compensation medical transactions from all private insurers in Montana and Montana State Fund, which are used in rate-setting calculations. Per the Department's request, NCCI provided de-identified workers' compensation claims data for claims where an injured worker received at least one opioid prescription (defined as an *opioid claim*) between service years 2012 and 2017 and summarized by NCCI industry group and NCCI class codes. The data elements included gender, workers' age, age of claim, and average morphine milligram equivalents (MME).

A service year represents all the medical transactions occurring in a single calendar year regardless of workers' date of injury. An individual claim is counted a maximum of one time per service year but can contribute to the total count across multiple service years. For example, a worker who received one opioid prescription in 2012 and a refill prescription in 2013 would be counted in both service years. However, an injured worker who received an opioid prescription in 2012 and a refill prescription later that same year would only be counted once within service year 2012. To avoid double counting individuals across multiple years, distributions of opioid claims across gender, age at injury, and claim maturity represent the *average* between service years 2012 through 2017. However, there was little to no change in any of these distributions from year to year. The total count of opioid claims between service years 2012 and 2017 was 24,482, and Figure 1 illustrates the total for each year. There has been a noticeable decline in the number of opioid claims each service year, primarily attributed to less prescribing among new claims due to increased awareness nationwide of the risks associated with opioids. On average, 65% of opioid claims were for males, 31% of opioid claims were for individuals age 45-54, and 18% of opioid claims were for claims greater than 10 years mature.

Figure 1

Count of Opioid Claims by Service Year



Opioid Claims by NCCI Industry Group

NCCI industry groups include Contracting, Goods and Services, Manufacturing, Miscellaneous, and Office and Clerical. All industry groups were represented within the study period, and the distribution of opioid claims by NCCI industry groups has remained consistent between service years 2012 through 2017 (Figure 2). Although Goods and Services comprises almost half of all opioid claims each service year, it is likely that a larger proportion of the workforce falls within this industry classification. Opioid claims for men occurred more frequently in Contracting and Manufacturing compared to women, while opioid claims for women occurred more often in the Good and Services and Office and Clerical industries (Figure 3). For both men and women, workers aged 45 to 54 had the largest share of opioid claims.

Figure 2

Distribution of Opioid Claims by Industry Group by Year

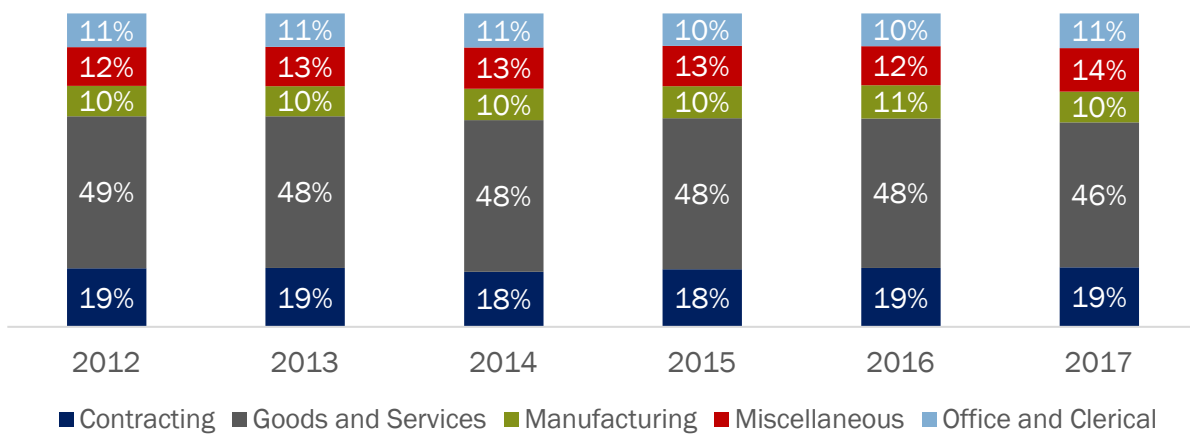
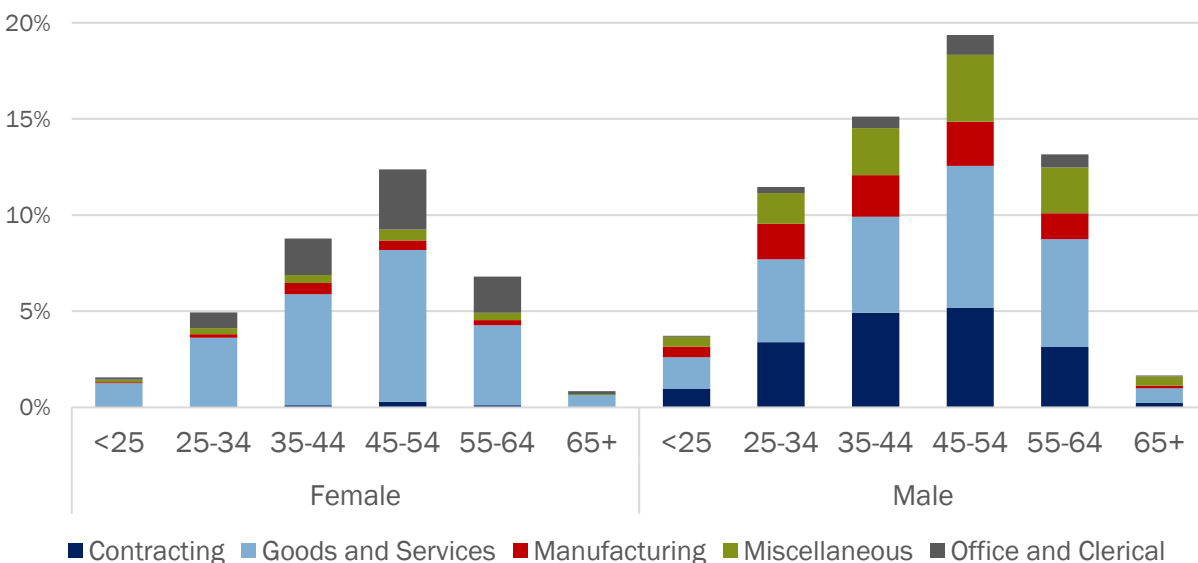


Figure 3

Distribution of Opioid Claims by Industry Group, Gender and Age (2012-2017)



Opioid Claims by NCCI Class Code – Overall Distribution

NCCI class codes characterize a worker’s occupation and are comprehensive. Within the study period, opioid claims occurred across 363 class codes. The overall distribution of opioid claims by NCCI class codes looks at the percentage of opioid claims for a given class code divided by the total number of opioid claims across all class codes. Overall distribution is limiting in that it does not control for the size of the workforce within a given class code. Therefore, class codes that comprise a larger percent of the workforce, such as restaurants, retail, and healthcare occupations, may account for a larger percentage of the overall distribution of opioid claims compared to class codes that comprise a relatively smaller percentage of the workforce, such as arts and entertainment and farming, fishing, and forestry occupations.²

Table 1 includes the 28 NCCI class codes that averaged 1% or more of the overall distribution of opioid claims across service years 2012 through 2017 and their associated NCCI industry group. Across these 28 class codes, over half of all opioid claims were accounted for each service year. Manufacturing, which comprised the lowest overall percentage of opioid claims across industry (likely related to a relatively lower workforce population), had no class codes with over 1% of the overall distribution of opioid claims. The closest Manufacturing class code was Saw Mill (2710), which comprised 0.9% on average.

Figures 4, 5, and 6 include class codes with the largest share of opioid claims by gender, claim maturity, and age. By gender, there is very little overlap in class codes with the largest share of opioid claims. For males, the largest share of opioid claims occurred in class codes associated with more physically intense labor, and for females, the largest share of opioid claims occurred in service and healthcare occupations. In Figure 5, opioid claims are separated by claim maturity. Montana has a high proportion of older claims receiving opioids, with approximately 40% of opioid claims each service year receiving an opioid prescription six or more years after injury (NCCI, 2018). However, there was little to no difference in the most frequently occurring class codes by claim maturity. Class codes with the greatest number of opioid claims for claims 11 years or older were also the class codes with the greatest number of opioid claims for claims less than 11 years mature. By age, there are several changes in class codes with the largest share of opioid claims moving from younger to older workers. For younger workers, Restaurants (9079 and 9082), Residential Construction (5645), and Automobile Service or Repair Centers (8380) were more common, while Clerical (8810), Trucking (7219), Hotel (9052), and Social Service Organizations (8864) had a greater proportion opioid claims among older workers. Although Farm and Ranching (0006) is found in all age groups, it becomes the class code with the largest share of opioid claims for workers age 35 and older.

Since we do not have the total number of employees covered by workers’ compensation for each class code, we cannot calculate the rate of opioid claims by class code. We can, however, look at distributions of opioid claims by NCCI class code *within* a single class code (starting on page 9).

² Occupational Employment Statistics Query System, Bureau of Labor Statistics

Table 1

NCCI Class Codes with Largest Share of Opioid Claims

		2012	2013	2014	2015	2016	2017	Mean
Contracting								
5645	Carpentry - Construction Of Residential Dwellings Not Exceeding Three Stories In Height	2.7%	2.9%	2.9%	2.9%	3.1%	3.5%	3.0%
5403	Carpentry - Construction Of Residential Dwellings Exceeding Three Stories In Height Or Commercial Buildings And Structures	1.3%	1.6%	1.4%	1.0%	0.9%	0.9%	1.2%
5183	Plumbing NOC & Drivers	1.1%	1.1%	0.9%	0.8%	1.3%	1.4%	1.1%
9421	State Of Montana Department Of Transportation Employees--All Other Employees & Drivers	1.1%	1.3%	0.9%	1.2%	1.4%	0.9%	1.1%
Good and Services								
0006	Farm Or Ranch--All Employees & Drivers	4.0%	4.2%	4.2%	4.3%	4.4%	5.0%	4.4%
8380	Automobile Service Or Repair Center & Drivers	3.7%	3.9%	3.7%	4.2%	4.1%	3.9%	3.9%
9079/ 9082	Restaurant NOC	2.9%	3.3%	3.1%	3.4%	3.2%	2.9%	3.1%
8017	Store: Retail NOC	3.8%	3.6%	3.5%	3.3%	2.1%	1.5%	3.0%
9052	Hotel: All Other Employees & Salespersons, Drivers	2.6%	2.9%	2.3%	2.4%	2.2%	2.6%	2.5%
8824	Retirement Living Centers: Health Care Employees	2.5%	2.1%	2.6%	2.7%	2.6%	2.4%	2.5%
8864	Social Services Organization-All Employees & Salespersons, Drivers	2.3%	2.3%	1.6%	1.5%	1.5%	2.0%	1.9%
8006	Gasoline Station: Self-Service And Convenience/Grocery-Retail	1.5%	1.8%	1.6%	1.9%	1.9%	1.7%	1.8%
8033	Store: Meat, Grocery And Provision Stores Combined-Retail NOC	1.3%	1.6%	2.2%	2.1%	1.7%	2.0%	1.8%
8842	Group Homes-All Employees & Salespersons, Drivers	1.6%	1.4%	1.4%	1.1%	1.3%	1.4%	1.4%
8834	State Of Montana Asylum, Hospital, Home, And Special School--Not Correctional--All Other Employees & Drivers	1.4%	1.3%	1.6%	1.4%	1.2%	1.3%	1.4%
8232	Lumberyard New Materials Only: All Other Employees & Yard, Warehouse, Drivers	1.3%	1.2%	1.1%	1.4%	1.5%	1.4%	1.3%
9015	Building Or Property Management - All Other Employees	1.6%	1.3%	1.4%	1.1%	1.2%	0.9%	1.2%
8835	Home, Public, And Traveling Healthcare--All Employees	1.5%	1.1%	1.0%	0.8%	1.2%	1.0%	1.1%
9014	Janitorial Services By Contractors - No Window Cleaning Above Ground Level & Drivers	1.3%	1.2%	1.0%	1.1%	1.0%	0.7%	1.1%
9083	Restaurant: Fast Food	1.0%	0.9%	1.1%	1.0%	1.2%	0.7%	1.0%
8010	Store: Hardware	0.9%	0.9%	0.9%	1.1%	1.2%	0.9%	1.0%
Office and Clerical								
8810	Clerical Office Employees NOC	3.6%	3.4%	3.3%	3.1%	3.0%	2.9%	3.2%
8833	Hospital: Professional Employees	1.1%	1.0%	1.1%	1.1%	1.2%	1.4%	1.2%
8742	Salespersons Or Collectors-Outside	1.1%	1.0%	1.2%	1.1%	1.1%	1.3%	1.1%
8832	Physician & Clerical	0.9%	0.9%	1.2%	1.2%	1.2%	1.1%	1.1%
Miscellaneous								
7219	Trucking: NOC-All Employees & Drivers	2.9%	2.7%	2.5%	2.2%	2.3%	2.8%	2.6%
7380	Drivers, Chauffeurs, Messengers And Their Helpers NOC-Commercial	1.2%	1.4%	1.4%	1.2%	1.4%	1.2%	1.3%
7721	State Of Montana Penal Or Correctional Institution--All Other Employees & Drivers	0.9%	1.0%	1.0%	0.9%	1.1%	1.0%	1.0%
Percent of All Opioid Claims		53.0%	53.3%	52.1%	51.7%	51.6%	50.9%	52.1%

Figure 4

NCCI Class Codes with Largest Share of Opioid Claims by Gender

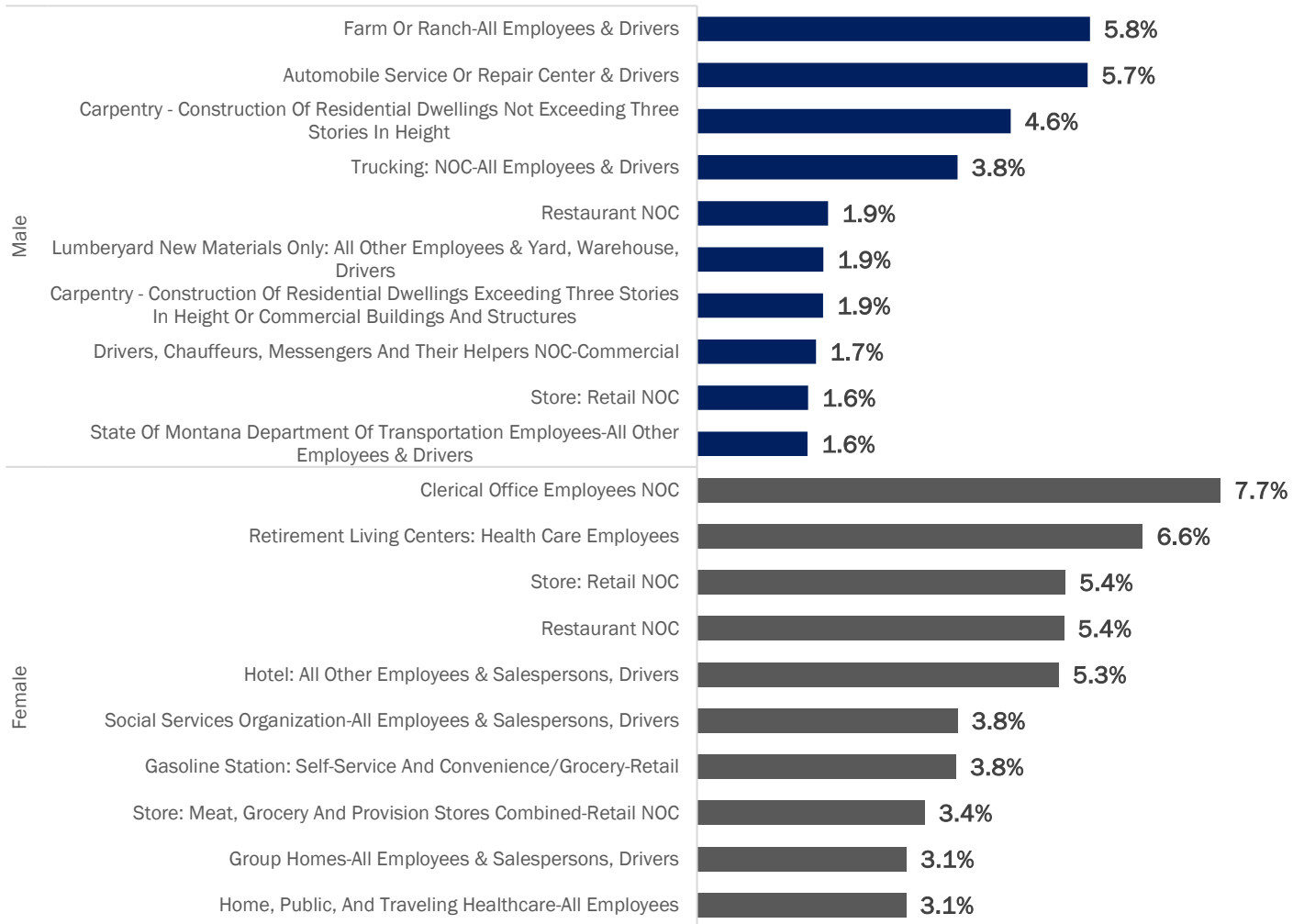
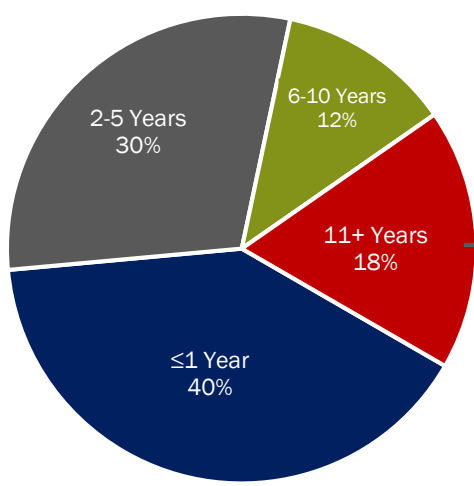


Figure 5

Opioid Claims by Claim Maturity and Top 10 Class Codes for Opioid Claims 11+ Years Mature

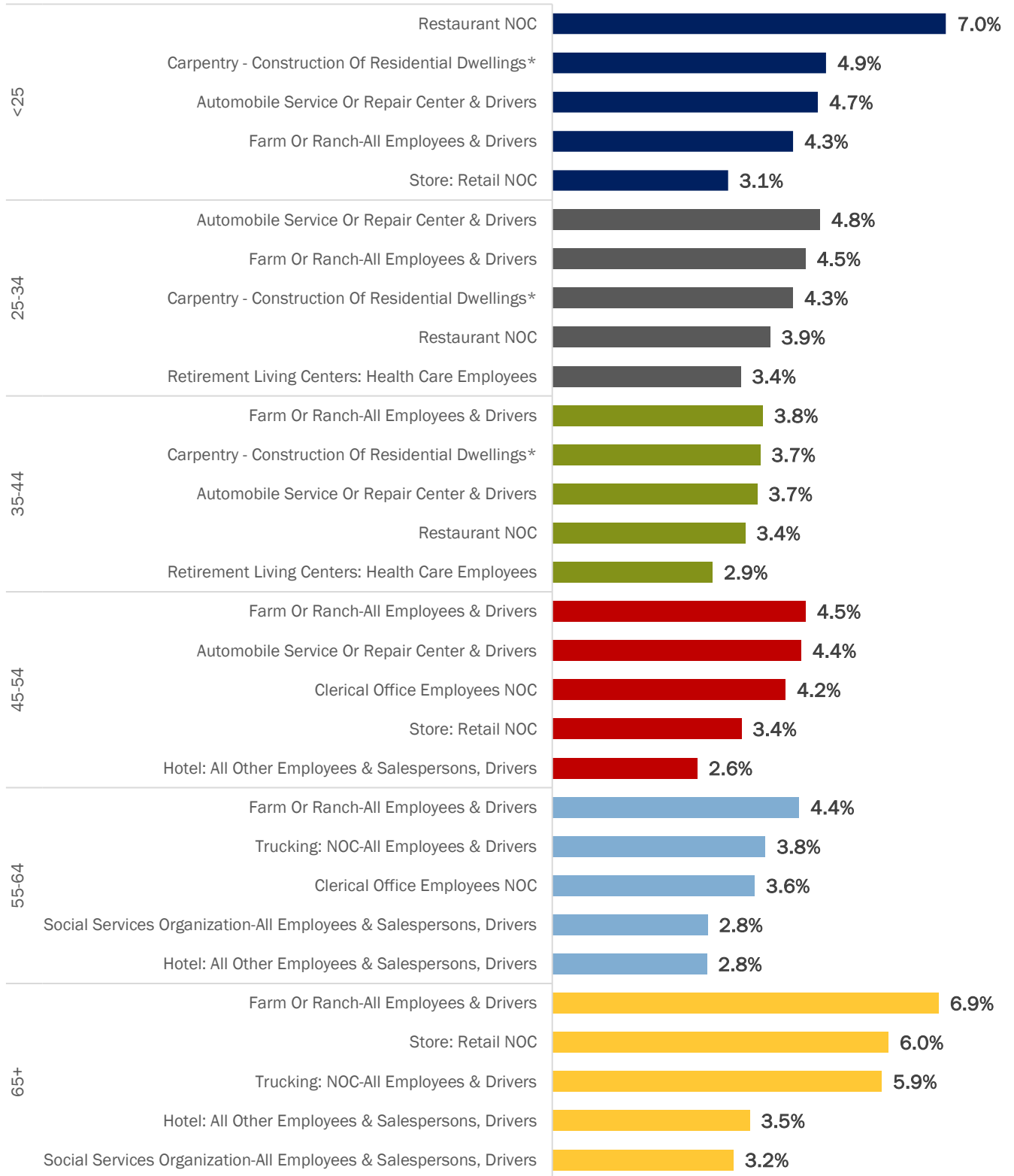


1. Restaurant NOC
2. Clerical Office Employees NOC
3. Farm Or Ranch—All Employees & Drivers
4. Carpentry – Construction of Residential Dwellings Not Exceeding Three Stories In Height
5. Automobile Service Or Repair Center & Drivers
6. State Of Montana Asylum, Hospital, Home, And Special School—Not Correctional—All Other Employees & Drivers
7. Store: Retail NOC
8. Social Services Organization-All Employees & Salespersons, Drivers
9. Salespersons Or Collectors-Outside
10. Retirement Living Centers: Health Care Employees

There was *little difference* in the top 10 most frequent class codes for more mature claims versus the top 10 most frequent class codes for newer claims.

Figure 6

NCCI Class Codes with Largest Share of Opioid Claims by Age at Injury



Opioid Claims by NCCI Class Code – Distributions Within a Single Class Code

Another way to consider opioid claim data is to look at the distributions *within* each individual class code, rather than looking at the distribution across *all* opioid claims. For this section, only class codes that averaged 20 or more opioid claims from 2012 through 2017 are included. Figure 7 ranks these class codes from high to low based on the proportion of claims within a class code that were prescribed an opioid. The distributions within class codes range from a low of 11% of claims to a high of 67% of claims with a median of 21% of claims.

Opioid strength and prescription duration vary considerably. Morphine milligram equivalent (MME) controls for these differences by assigning a conversion factor to opioids to calculate an equivalent daily dose of morphine. For example, 1 mg of codeine is equivalent to .15 MME, while 1 mg of Oxycodone is equivalent to 1.5 MME. Figure 8 ranks class codes from high to low based on the average MME per opioid claim within each class code between service years 2012 through 2017. The CDC guidelines for the prescribing of opioids recommends providers should use caution when prescribing over 50 MME/day and should avoid prescribing over 90 MME/day. For acute pain, the CDC recommends providers prescribe no more than needed for the expected duration of pain and notes that three days is generally sufficient, while seven days is rarely necessary (Dowell et al., 2016). As a point of reference, a 7-day opioid prescription at 50 MME/day is a total of 350 MME and a 7-day opioid prescription at 90 MME/day equals 630 MME. In Figure 8, the average MME per opioid claim for class codes with an average of 20 or more opioid claims per year ranged from a low of 1,119 MME to a high of 29,629 MME with a median of 9,083 MME. This suggests that, on average, opioid claims for class codes in Figure 8 may be utilizing either higher than recommended doses of opioids per day or may be utilizing opioids on a longer-term basis. By service year, most class codes have a flat or downward trend for both percent of opioid claims within a class code and average MME per opioid claim within the study period. Eight class codes were identified that had an increasing linear trend in MME from service year 2012 to service year 2017 (Figure 9).

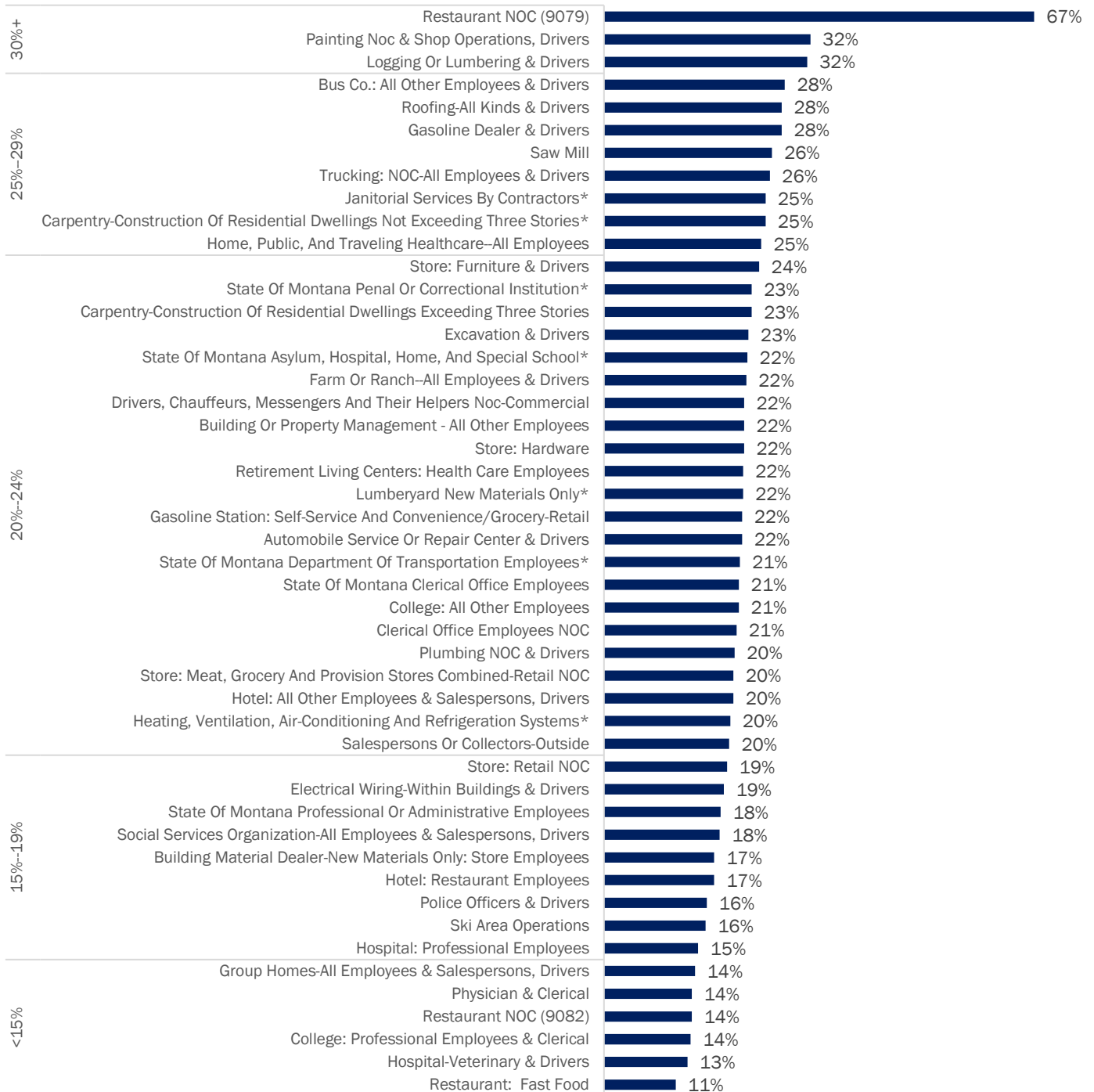
Alternatively, average MME may be skewed higher if a small number of claims consume the majority of the MME within a given class code. Previous analysis by NCCI has shown that the majority of MME consumed each service year is concentrated within a small number of claims. From the *NCCI Medical Data Report: Opioid Utilization Supplement* for service year 2017, 70% of the total MME was consumed by the top 10% of all opioid claims (classified as Heavy Users), 24% of total MME was consumed by the 70th-90th percentiles (classified as Moderate Users), and 6% of total MME was consumed by the bottom 70% of claims (classified as Mild Users). Within these groups, average yearly MME in Montana was approximately 63,900 MME/year for Heavy Users, 11,000 MME/year for Moderate Users, and 700 MME/year for Mild Users.

Based on the consumption classifications established by NCCI, we attempted to identify the class codes with the greatest frequency within each consumption group to determine whether there were class codes more common among Heavy Users compared to Moderate and Mild Users. Instead, we found considerable overlap in class codes by consumption. Using the top 25 class codes across Heavy, Moderate, and Mild consumption, there were 5 class codes found only among Heavy Users, 11 class codes found only among Mild/Moderate Users, and 20 class codes that occurred in Heavy and Mild/Moderate Users, 15 of which occurred in all three classifications. For the 25 class codes with the highest frequency of opioid claims within each consumption classification, there were 5 class codes that occurred only among Heavy Users, including Saw Mill (2710), Logging or Lumbering

& Drivers (2702), Coal Mining-Surface & Drivers (1005), Bus Co.: All Other Employees & Drivers (7382), and Store: Furniture & Drivers (8044). All were class codes that averaged greater than 15,000 MME per opioid claim in Figure 8 other than Coal Mining-Surface & Drivers (1005), which was not included in Figure 8 because fewer than 20 opioid claims occurred for this class code on average. The average MME per opioid claim for Coal Mining- Surface & Drivers was 30,574 MME.

Figure 7

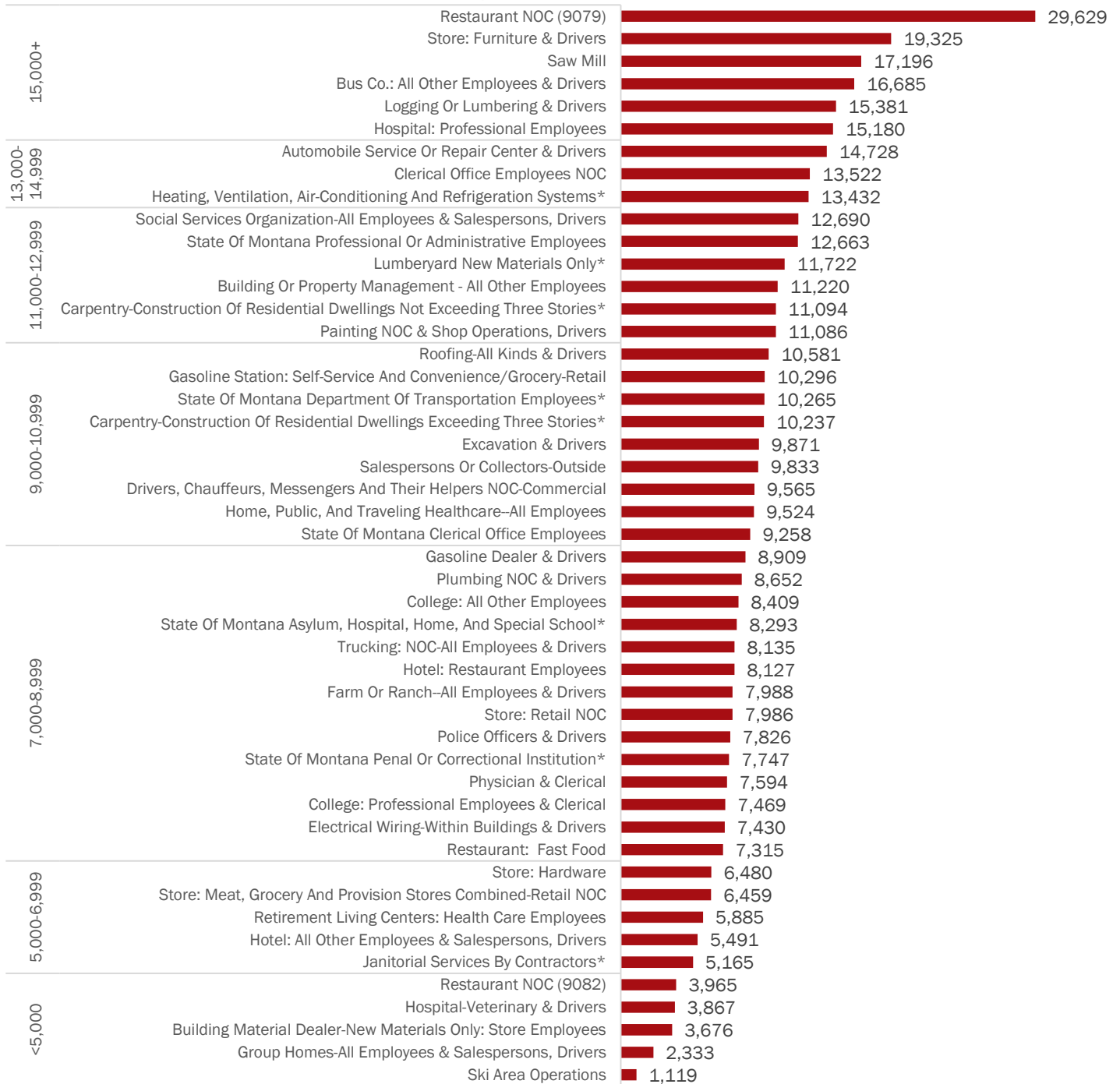
Average Percentage of Opioid Claims Within a Class Code (2012-2017)



*Figure 7 includes class codes that averaged 20 or more opioid claims from 2012 through 2017.

Figure 8

Average MME per Opioid Claim by Class Code (2012-2017)

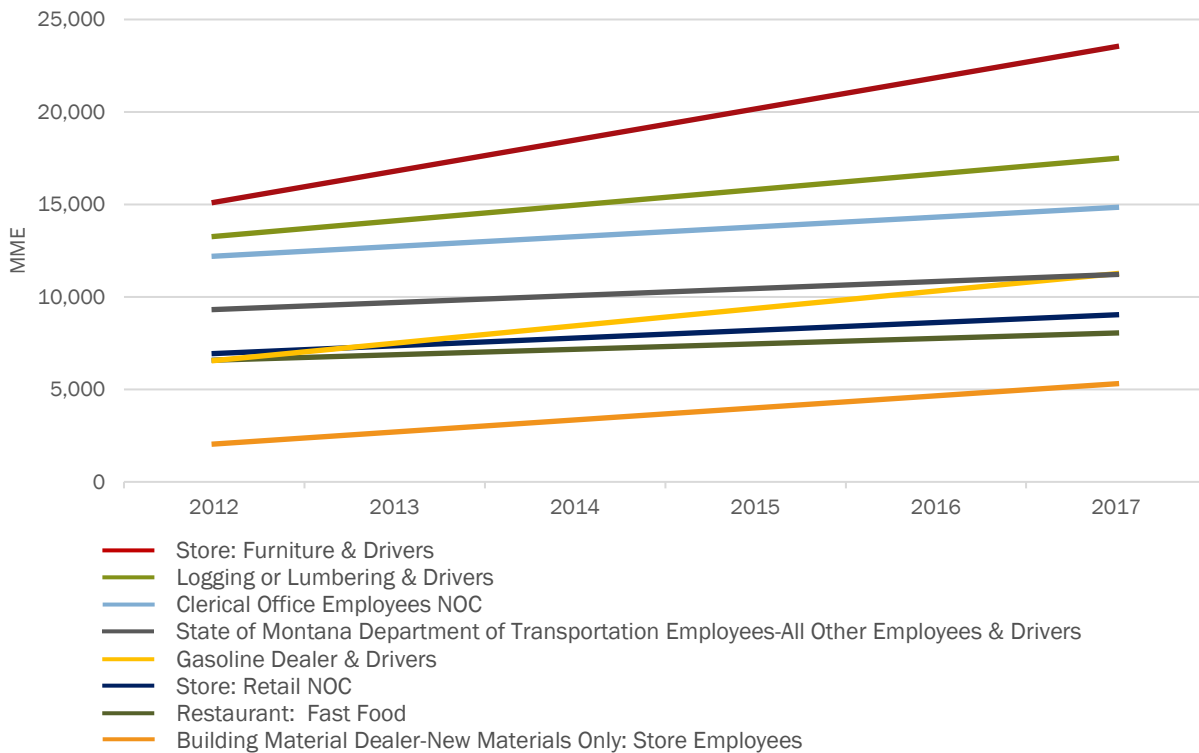


*Full Class Code Descriptions for Figure 7 and Figure 8:

- Janitorial Services By Contractors - No Window Cleaning Above Ground Level & Drivers
- Carpentry - Construction Of Residential Dwellings Not Exceeding Three Stories In Height
- State Of Montana Penal Or Correctional Institution-All Other Employees & Drivers
- Carpentry - Construction Of Residential Dwellings Exceeding Three Stories In Height Or Commercial Buildings And Structures
- State Of Montana Asylum, Hospital, Home, And Special School-Not Correctional-All Other Employees & Drivers
- Lumberyard New Materials Only: All Other Employees & Yard, Warehouse, Drivers
- State Of Montana Department Of Transportation Employees-All Other Employees & Drivers
- Heating, Ventilation, Air-Conditioning And Refrigeration Systems-Installation, Service And Repair, Shop, Yard & Drivers

Figure 9

Average MME per Opioid Claim by Service Year – Class Codes with Upward Trendlines



One noticeable discrepancy occurs between Restaurant NOC class code 9079, with the highest percentage of claims and the highest average MME, and Restaurant NOC class code 9082, which falls on the lower ends in Figures 7 and 8. This can be explained by a change in class code classifications effective in 2005. Restaurant NOC class code 9079 was replaced with Restaurant NOC class code 9082, as well as class codes 9083 and 9084. Therefore, opioid claims falling under Restaurant NOC class code 9079 must be for injuries occurring prior to July 1, 2005, while opioid claims falling under Restaurant NOC class code 9082 include only injuries after July 1, 2005. This reinforces previous findings from NCCI data which shows that each service year, a large percentage of opioid claims in Montana are for more mature claims, especially compared to the region and countrywide distributions. Because of this, Restaurant NOC class code 9079 may not be comparable to other class codes listed, despite a high percentage of opioid claims and high average MME.

Finally, although NCCI does not utilize NAICS industry codes, workers' compensation claims within the Department administrative database include both the associated NCCI class code and the associated NAICS industry code. An individual class code may fall under multiple industry codes, but many class codes are dominated by a single industry code. For example, 88% of claims associated with carpentry class codes fall within the construction industry. Table 2, lists the most frequently associated NAICS industry for class codes with an average of 20 or more opioid claims per service year. If claims associated with an individual class code did not comprise more than 50% of any one industry, then the class code was classified as "Multiple Industries."

Table 2

Most Frequent Industries by NAICS for Class Codes with ≥20 Opioid Claims per Service Year

Agriculture, Forestry, Fishing & Hunting	
0006	Farm Or Ranch--All Employees & Drivers
2702	Logging Or Lumbering & Drivers
Construction	
5645	Carpentry - Construction Of Residential Dwellings Not Exceeding Three Stories In Height
5403	Carpentry - Construction Of Residential Dwellings Exceeding Three Stories In Height Or Commercial Buildings And Structures
5183	Plumbing NOC & Drivers
5537	Heating, Ventilation, Air-Conditioning And Refrigeration Systems-Installation, Service And Repair, Shop, Yard & Drivers
5474	Painting NOC & Shop Operations, Drivers
6217	Excavation & Drivers
5190	Electrical Wiring-Within Buildings & Drivers
5551	Roofing-All Kinds & Drivers
Manufacturing	
2710	Saw Mill
Retail Trade or Wholesale Trade	
8380	Automobile Service Or Repair Center & Drivers
8044	Store: Furniture & Drivers
8350	Gasoline Dealer or Drivers
8058	Building Material Dealer-New Materials Only: Store Employees
8232	Lumberyard New Materials Only: All Other Employees & Yard, Warehouse, Drivers
8006	Gasoline Station: Self-Service And Convenience/Grocery-Retail
8010	Store: Hardware
8033	Store: Meat, Grocery And Provision Stores Combined-Retail NOC
8017	Store: Retail NOC
Transportation & Warehousing	
7382	Bus Co.: All Other Employees & Drivers
7219	Trucking: NOC-All Employees & Drivers
Real Estate, Rental, & Leasing	
9015	Building Or Property Management - All Other Employees
Professional, Scientific, & Technical Services	
8831	Hospital-Veterinary & Drivers
Administrative, Support, Waste Management, & Remediation Services	
9014	Janitorial Services By Contractors - No Window Cleaning Above Ground Level & Drivers
8834	State Of Montana Asylum, Hospital, Home, And Special School--Not Correctional--All Other Employees & Drivers
8811	State Of Montana Clerical Office Employees
8744	State Of Montana Professional Or Administrative Employees
Educational Services	
9101	College: All Other Employees
8868	College: Professional Employees & Clerical
Health Care & Social Assistance	
8833	Hospital: Professional Employees
8832	Physician & Clerical
8824	Retirement Living Centers: Health Care Employees
8864	Social Services Organization-All Employees & Salespersons, Drivers
8842	Group Homes-All Employees & Salespersons, Drivers
8835	Home, Public, And Traveling Healthcare--All Employees
Arts, Entertainment, & Recreation	
9187	Ski Area Operations
Accommodations & Food Services	
9079	Restaurant NOC
9082	Restaurant NOC
9083	Restaurant: Fast Food
9052	Hotel: All Other Employees & Salespersons, Drivers
9058	Hotel: Restaurant Employees
Public Administration	
7721	State Of Montana Penal Or Correctional Institution--All Other Employees & Drivers
9421	State Of Montana Department Of Transportation Employees--All Other Employees & Drivers
7720	Police Officers & Drivers
Multiple Industries	
7380	Drivers, Chauffeurs, Messengers And Their Helpers NOC-Commercial
8810	Clerical Office Employees NOC
8742	Salespersons Or Collectors-Outside

Opioid-Related Overdose Deaths

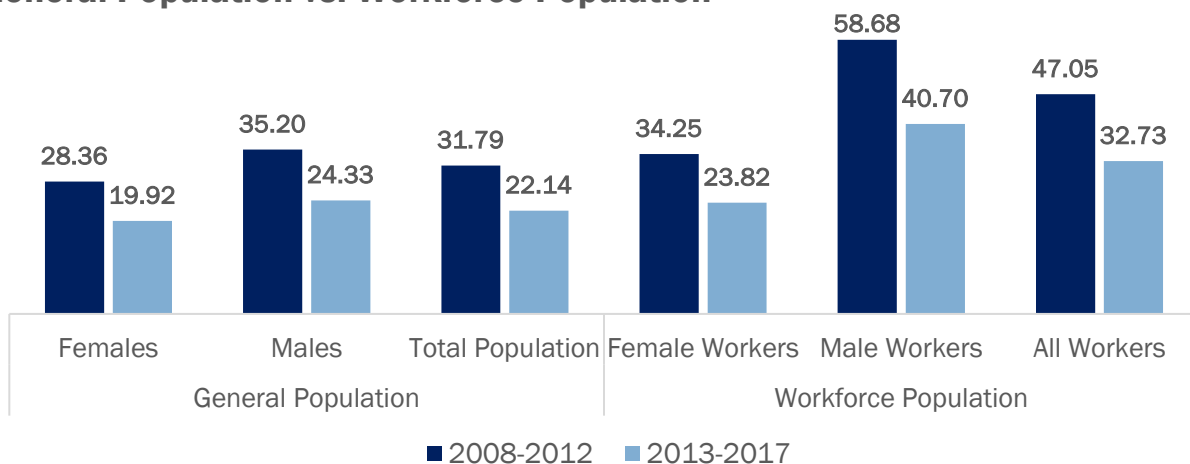
Data Overview

Death certificate data from the Montana Department of Public Health and Human Services (DPHHS) was utilized to assess opioid-related overdose deaths. Death certificates include information about an individual’s industry and occupation. Industry was coded based on the North American Industry Classification System (2007), and occupation was coded based on the Standard Occupational Classification System (2010). To identify opioid-related overdose deaths, all deaths with multiple-cause of death codes T40.1–T40.4 and T40.6 were flagged. The total number of deaths flagged as opioid-related between 2008 and 2017 was 543. From here, 137 cases were removed, which included students, homemakers, disabled or unemployed individuals, and children. An additional 8 cases did not have enough information to identify either industry nor occupation. In some cases, an individual may have industry classified but not occupation, or vice versa. Therefore, the total number of cases by industry was 388 and the total number by occupation was 384.

Death certificates also include information on an individual’s age and gender. Between 2008 and 2017, 65% of all opioid-related overdose deaths were male and 91% were between the ages of 25 and 64, generally considered to be the working-age population, with the highest proportion of opioid-related overdose deaths for workers age 45 to 54 (29%). Using the American Community Survey 5-year estimates for the periods of 2008-2012 and 2013-2017, rates were calculated for opioid-related overdose deaths for the general population in Montana and for Montana’s workforce population and by gender (Figure 10). The workforce population had higher opioid-related overdose deaths compared to the general population, and working males had the highest rate of opioid-related overdose deaths overall.

Figure 10

Rate of Opioid-Related Overdose Deaths per 100,000 – General Population vs. Workforce Population



Compared to other states, Montana’s relatively smaller workforce makes calculating rates by industry and occupation problematic and a significant portion of the data is suppressed. Therefore, analysis will focus on industry and occupation groups where rates are viable and on counts. As above, the American Community Survey 5-year estimates are used to calculate rates for the periods of 2008-2012 and 2013-2017 where rates are reported.

Opioid-Related Overdose Deaths by Industry

The total count of opioid-related overdose deaths by industry was 388 between 2008 and 2017. The industries with the most opioid-related overdose deaths include construction, health care and social assistance, and accommodation and food services (Figure 11). Although these industries comprised almost half of all opioid-related overdose deaths in the study period, the rates across these industries varied. The rate for opioid-related overdose deaths per 100,000 workers in health care and social assistance was similar to the rate across all workers, while construction and accommodation and food services industries were considerably higher than the average rate across all workers. By itself, construction doubled the rate for all workers in both time periods (Table 3).

Figure 11

Distribution of Opioid-Related Overdose Deaths by Industry (2008-2017)



Table 3

Construction vs. Health Care and Social Assistance vs. Accommodation and Food Services Industries

	2008-2017 Percent of Total Deaths	2008-2012 Rate per 100,000 Workers	2013-2017 Rate per 100,000 Workers
Construction	17%	94.59	70.83
Health Care and Social Assistance	14%	47.00	33.51
Accommodation and Food Services	13%	68.96	55.00
All Workers	100%	47.05	32.73

*Counts for other industry groups were too small to produce rates and could not be published.

Table 4 ranks the industries with the highest counts of opioid-related overdose deaths by gender. Percentages are suppressed due to small counts in some categories. Deaths in the construction industry were primarily males, while over half of all opioid-related overdose deaths for females were within health care and social assistance and accommodation and food service industries. For industries with the highest frequency of opioid-related overdose deaths, Figure 12 illustrates the distribution within each age group. For example, for all opioid-related deaths for workers aged 16 to 24, 21% were within the construction industry. Within age group distributions are meaningful because, for example, workers age 16 to 24 may comprise a small percentage of the overall distribution of opioid-related overdose deaths in construction, but for all opioid-related overdose deaths among 16 to 24-year-olds, a fifth are for this one industry group.

Table 4

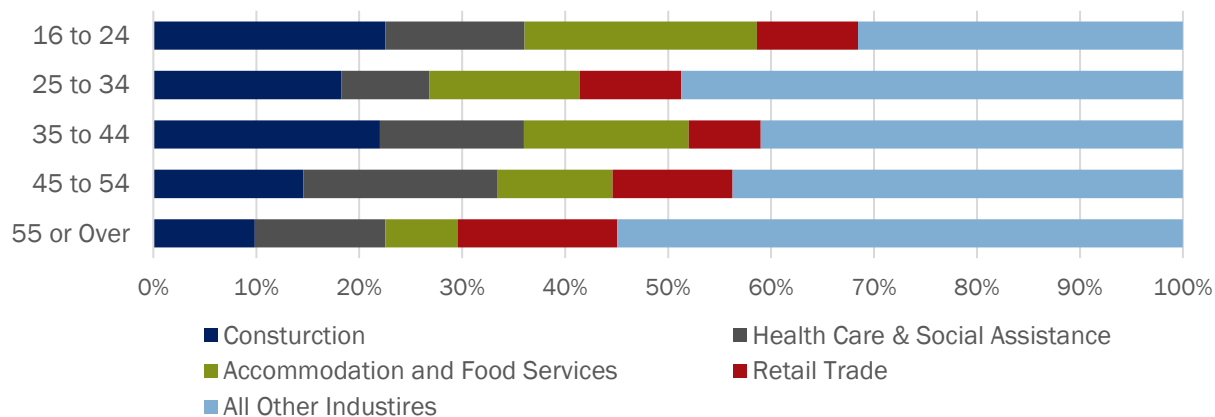
Industries with Highest Frequency of Opioid-Related Overdose Deaths by Gender (2008-2017)

	Males	Females
1	Construction	Health Care & Social Assistance
2	Retail Trade	Accommodation & Food Services
3	Accommodation & Food Services	Other Services (except Public Admin.)
4	Agriculture, Forestry, Fishing & Hunting	Retail Trade

*Percentages suppressed

Figure 12

Industries with Highest Frequency of Opioid-Related Overdose Deaths by Age (2008-2017) – Within Age Distribution



Opioid-Related Overdose Deaths by Occupation

The total count of opioid-related overdose deaths between 2008 and 2017 by industry was 384. Between 2012 and 2017, service and support occupations and natural resource, construction, and maintenance occupations each comprised 28% of the total opioid-related overdose deaths. Service and support occupations includes healthcare support (SOC code 31-0000), protective service (SOC code 33-0000), food preparation and serving related (SOC code 35-0000), personal care and service (SOC code 39-0000), and building and grounds cleaning occupations (SOC code 37-0000). Natural resource, construction and maintenance includes farming, fishing, and forestry (SOC code 45-0000), construction and extraction (SOC code 47-0000), and installation, maintenance, and repair occupations (SOC code 49-0000). Another 13% of opioid-related overdose deaths were in sales and

office occupations, which included sales and related (SOC code 41-0000) and office and administrative support (SOC code 43-0000).

Although service and support and natural resource, construction, and maintenance occupations account for an equal portion of the total distribution of opioid-related overdose deaths by occupation, the distribution ignores the number of people employed within each occupational group (Figure 13). Table 5 includes the rate per 100,000 workers for service and support, natural resource, construction, and maintenance, and sales and office occupations, as well as for all workers. Most noticeably, in the 2008-2012 period, the rate in construction and extraction was triple the average rate across all workers and over double the average rate across all workers in the 2013-2017 period. Additionally, while the breakdown for service and support occupations ranges from a low of 2% for protective services and a high of 9% for food preparation and serving related, the breakdown for natural resource, construction, and maintenance is driven almost exclusively by construction and extraction occupations, with 20% of all opioid-related overdose deaths.

Figure 13

Distribution of Opioid-Related Overdose Deaths by Occupation (2008-2017)

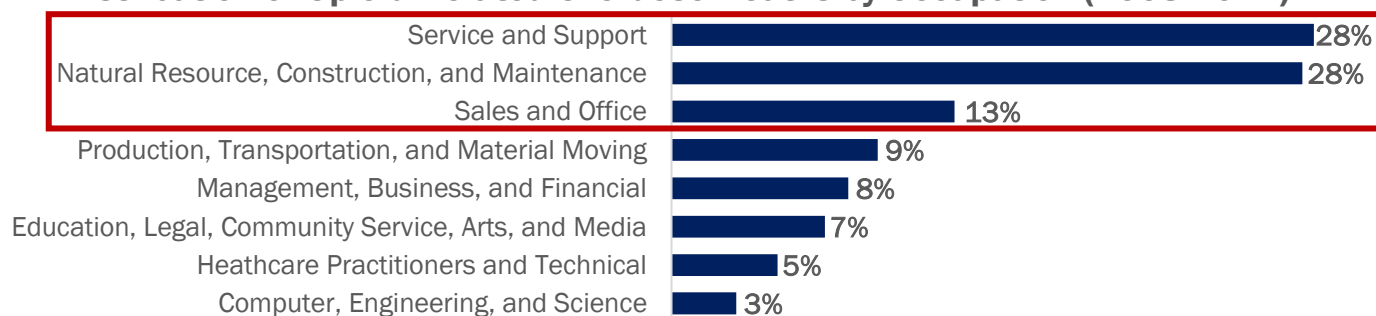


Table 5

Service and Support vs. Natural Resource, Construction, and Maintenance vs. Sales and Office Occupations

	2008-2017 Percent of Total Deaths	2008-2012 Rate per 100,000 Workers	2013-2017 Rate per 100,000 Workers
Service and Support	28%	69.51	48.73
Healthcare Support	4%	-	-
Protective Services	2%	-	-
Food Preparation and Serving Related	9%	-	-
Building and Grounds Cleaning	8%	-	-
Personal Care and Service	6%	-	-
Natural Resource, Construction, and Maintenance	28%	111.73	64.06
Farming, Fishing, and Forestry	3%	-	-
Construction and Extraction	20%	142.15	78.10
Installation, Maintenance, and Repair	5%	-	-
Sales and Office	13%	22.02	20.70
Sales and Related	8%	-	-
Office and Administrative Support	4%	-	-
All Workers	100%	47.05	32.73

*Counts for other occupation groups were too small to produce rates and could not be published.

Table 6 ranks the occupations with the highest counts of opioid-related overdose deaths by gender. Percentages are suppressed due to small counts in some categories. However, while the distribution for females was similar across many occupations, the distribution for men was dominated by construction and extraction, with opioid-related overdose deaths in construction and extraction occurring primarily among males. Construction and extraction was also the occupation with the highest frequency of opioid-related overdose deaths across all age groups. For occupations with the highest frequency of opioid-related overdose deaths, Figure 14 illustrates the distribution within each age group. For example, for all opioid-related deaths for workers aged 16 to 24, 23% were within the construction and extraction. Within age group distributions are meaningful because, for example, workers age 16 to 24 may comprise a small percentage of the overall distribution of opioid-related overdose deaths in construction and extraction, but for all opioid-related overdose deaths among 16 to 24-year-olds, nearly a quarter are for this one occupation group.

Table 6

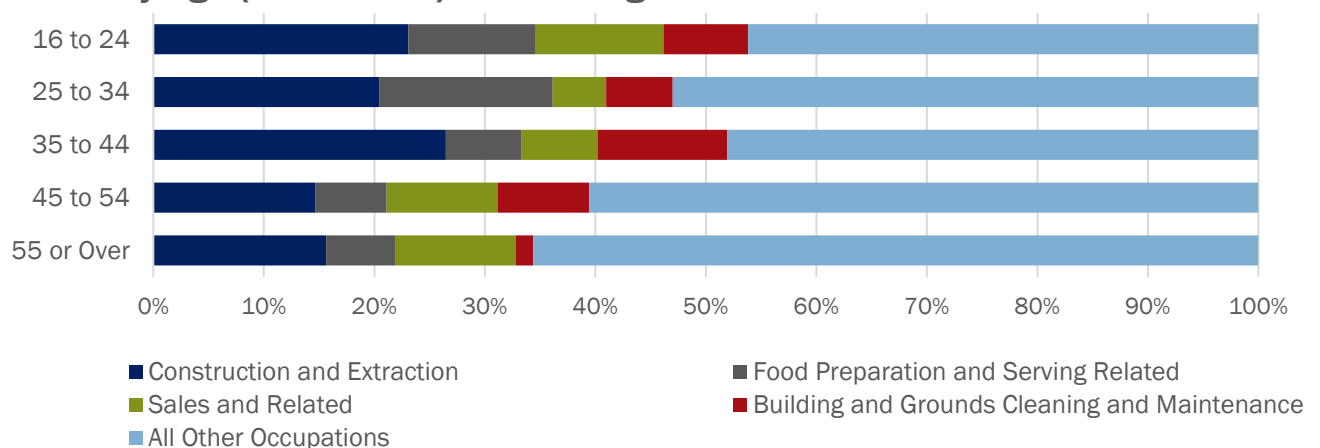
Occupations with Highest Frequency of Opioid-Related Overdose Deaths by Gender (2008-2017)

	Males	Females
1	Construction and Extraction	Personal Care and Service
2	Sales and Related	Building and Grounds Cleaning
3	Transportation and Material Moving	Healthcare Support
4	Food Preparation and Serving Related	Food Preparation and Serving Related

*Percentages suppressed

Figure 14

Occupations with Highest Frequency of Opioid-Related Overdose Deaths by Age (2008-2017) – Within Age Distribution



Conclusion

Although no causal inferences can be made, we were able to identify NCCI class codes with greater opioid prescribing in workers' compensation, as well as industries and occupations associated with opioid-related overdose deaths. Among workers who filed a workers' compensation claim and received at least one opioid prescription, Farm and Ranch (0006) stands out with the highest percentage of the overall distribution of opioid claims. This may be especially worrisome if we consider the relatively low rate of employment among farm and ranch occupations compared to other occupation groups in Montana which boast higher employment counts. A high number of opioid claims with a lower employment count would result in a relatively higher rate of opioid claims in Farm and Ranch (0006) occupations. However, without knowing the total number of workers covered by workers' compensation in Farm and Ranch (0006), this is only speculation. For class codes with an average of 20 or more opioid claims per service year, investigation of within class code distributions revealed a median of 21% of all claims in each class code were prescribed an opioid and high average MME per claim across class codes compared to what is recommended by the CDC. Half of these class codes are most commonly found within the construction, retail/wholesale trade, or health care and social assistance industries. With regards to opioid-related overdose deaths, the findings were parallel to previous research. Rates were highest among workers employed in construction industries and occupations, which suggests working in construction may be a contributing factor to opioid-related overdose deaths.

These results may at least be partially explained by the dangerous nature of working in construction, resulting in more frequent, severe injuries and possibly in a greater need for pain management. In Montana in 2017, the injury and illness rate with days away from work per 10,000 FTE across all industries and occupations was 125.4, compared to a rate of 187.0 in the construction industry. The median number of days away from work for all industries was 7 days and the median for construction was 12 days. Similarly, the construction and extraction occupation had an incidence and illness rate of 268.5 injuries with days away from work per 10,000 FTE and a median of 12 days away from work (U.S. DOL, BLS). In workers' compensation, higher claims costs are often indicative of greater injury severity. For wage loss claims reported to the Department between 2013 and 2017, median medical benefits across all claims were \$8,300 and median wage loss benefits were \$3,004. By NAICS code, for claims within the construction industry, median medical benefits were \$9,051 and median wage loss benefits were \$4,325. We also observe higher costs for claims falling under the NCCI farm and ranch class code, with median medical benefits of \$14,041 and median wage loss benefits of \$3,602 (MT DLI, ERD).

Additional research at the state level may focus on differences in types of injury across opioid claims versus non-opioid claims, as well as geographic differences across cities and counties, as Montana's rural nature may also be a contributing factor if alternative treatments to pain are inaccessible or do not exist. Any correlation between a workers' compensation claim and opioid-related overdose death is also unclear. Of the opioid-related overdose deaths where industry and/or occupation were identified, 23% filed a workers' compensation claim in the 5 years prior, of which 7% involved wage-loss (MT, DLI). However, it's unknown whether an individual's work-related injury resulted in an opioid prescription or an opioid-related overdose death.

At the Department, we continue to monitor and report trends in opioid utilization through NCCI medical data reports and NCCI data requests to contribute to the growing body of research on opioids in the workforce and to help inform where education, support, and resources may be most useful in helping to reduce opioid misuse.

Resources

The following resources provide useful information and tools related to opioids in the workforce:

- **Opioids at Work Employer Toolkit** – <https://www.nsc.org/pages/prescription-drug-employer-kit>
In their employer toolkit, the National Safety Council has put together research and resources to educate both workers and employers and to assist employers in implementing a workplace program on opioids. The toolkit includes “sample policies, fact sheets, presentations, safety talks, posters, white papers, reports, videos and more”.
- **Using Naloxone to Reverse Opioid Overdose in the Workplace: Information for Employers and Workers** – <https://www.cdc.gov/niosh/docs/2019-101/background.html>
Naloxone is a life-saving drug capable of reversing the effects of an opioid overdose. In 2017, Montana expanded access to naloxone by allowing pharmacies to distribute naloxone without a prescription. The National Institute for Occupational Safety and Health (NIOSH) developed information to assist employers in deciding whether to establish a naloxone use program in the workplace.
- **Workplace Solutions: Medication-Assisted Treatment for Opioid Use Disorder** – <https://www.cdc.gov/niosh/docs/wp-solutions/2019-133/pdfs/2019-133.pdf?id=10.26616/NIOSH PUB2019133>
Medication-assisted treatment (MAT) combines medication and behavioral therapy to treat opioid use disorder. NIOSH provides information for workers in understanding and accessing MAT and for employers wishing to support workers with opioid use disorder.
- **#FarmTownStrong** – <https://farmtownstrong.org/>
Recognizing the challenges of treating opioid misuse in rural areas, the National Farmers Union and American Farm Bureau Federation partnered together to create #FarmTownStrong, a campaign which highlights the impacts of opioids to agriculture and ranch workers and provides education and resources for those seeking treatment.
- **Resources to Prevent Opioid Deaths in Construction** – <https://www.cpwr.com/research/opioid-resources>
With an association between opioid-related overdose deaths and construction established at both the state and national level, the Center for Construction Research and Training compiled a list of opioid-related resources for construction workers and employers.

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