WORK-RELATED FATAL INJURIES IN WYOMING 2012-2018

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wyomingworkforce.org/data/epidemiology
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Message from Director Cooley

While the topic of this report brings a heavy heart, I am very pleased to see its publication and grateful for the partnerships that make reporting like this possible. The data within this report were compiled from numerous state and local agencies and programs, and provide the most comprehensive profile of workplace injury deaths that occurred in Wyoming in recent years.

However, we recognize that the numbers reported are so much more than numbers. Each workplace death is a tragedy. Each number represents a loved-one gone, and families and friends grieving. This annual report is intended to reveal opportunities to prevent future occurrences of these tragic events. We encourage readers to take this information and use it toward that good purpose at every level.

For our part, at the Department of Workforce Services, this annual report helps to shape our programs and services. Through our direct services, we will continually seek new ways to identify and close gaps in safety protocols or planning in the workplace. Through community and industry partnerships, we will be a voice and leader in state-wide safety program planning and stakeholder engagement. These efforts directly align with the core of our agency mission - to ensure safe and fair workplaces for all.

Thank you for reading and please contact us with any questions or needs for more information. Our occupational epidemiologist and team of safety and risk specialists are eager to help.

Robin Sessions Cooley
Director, Department of Workforce Services

Contact us:
dws-publicaffairs@wyo.gov
307-777-6513
Note to Readers
Every year, two programs at the Wyoming Department of Workforce Services collect and report data on all work-related injury deaths that occurred in Wyoming: the State Occupational Epidemiology program and the federally-run Census of Fatal Occupational Injuries (CFOI). The differences in program confidentiality restrictions and information access often result in the two strategies producing different counts of workplace deaths. The two programs collect similar information but have two different goals:

- The federal Census of Fatal Occupational Injuries (CFO) collects standardized data across states and the nation for the official count of work-related fatalities.
- The State Occupational Epidemiology program provides more detailed reporting of work-related fatalities that have occurred in Wyoming.

More information and data from the Census of Fatal Occupational Injuries: doe.state.wy.us/lmi/safety.htm
More information and data from State Occupational Epidemiology: wyomingworkforce.org/data/epidemiology/

The Wyoming Occupational Safety and Health Administration (OSHA) and The Wyoming State Mines Inspection & Safety Office also conduct comprehensive investigation and reporting of any work-related death that occurred within their regulatory authority.
Wyoming OSHA Fatal Alerts are available online: wyomingworkforce.org/businesses/osha/accidentalalerts/
More information on State Mines Inspection & Safety: wyomingworkforce.org/workers/mines/

Methods and Definitions
For case identification and classification schemes used for this report, readers should refer to the companion document, Methods for State Occupational Epidemiology Surveillance of Work-Related Fatal Injuries (October 2019): wyomingworkforce.org/_docs/data/epidemiology/Fatality-Methods.pdf

Case Descriptions
This report provides a summary of state-identified occupational injury fatalities that occurred in Wyoming during 2012-2018. Brief descriptions of each fatality incident are published separately and are available online: wyomingworkforce.org/data/epidemiology/ While this summary report highlights prevention opportunities that may have the greatest impact, additional information and prevention insights may be obtained from reviewing the individual case descriptions.

Acknowledgements
This report would not be possible without the support and collaboration of numerous partners, including:

- Wyoming Department of Health, Vital Statistics Services
- Wyoming Department of Transportation, Highway Safety Program & Wyoming Highway Patrol
- Wyoming County Coroners
- Local Law Enforcement Offices
- Wyoming Department of Workforce Services
  - Occupational Safety and Health Administration (OSHA)
  - Workers’ Compensation Division
  - Research & Planning Section
  - State Mines Inspector
Executive Summary

Background
The Wyoming Department of Workforce Services (DWS) State Occupational Epidemiology program has collected and reported state-wide data on work-related injury fatalities since 2012. This annual report is intended to expand and supplement knowledge gained from the annual federal Census of Fatal Occupational Injuries (CFOI).

According to the federal CFOI, on average in Wyoming, 30 workers per year suffer fatal occupational injury and there has not been a sustained reduction in the annual number or rate of these deaths in over a decade. While the CFOI is recognized as the official record of workplace fatality trends, the data published for Wyoming don’t contain sufficient detail to identify specific prevention priorities or opportunities. Data from Wyoming Occupational Epidemiology and the federal CFOI are collected using similar methods and sources, but are not directly comparable due to possible differences in case ascertainment and classification. However, the state data do follow similar patterns as the federal data, as noted throughout this report.

Results
During the period 2012-2018, Wyoming Occupational Epidemiology identified 189 occupational injury fatalities. The Transportation and Warehousing industry accounted for the largest proportion (28%), followed by the Agriculture, Forestry, Fishing and Hunting industry (17%), and the Oil & Gas Extraction and Production industries (14%). The Construction industry and the Oil & Gas Extraction and Production industries saw a notable increase in worker fatalities from 2017 to 2018, which was partially attributed to an increase in motor vehicle incidents. (See the 2012-2018 Case Descriptions: wyomingworkforce.org/data/epidemiology)

Of the 189 deaths identified during this time, 30% were under Wyoming OSHA jurisdiction for investigation and 67% were Wyoming residents. Fifty-one percent of all fatalities (n=97) were due to motor vehicle incidents:
- 65 were roadway travel motor vehicle crashes; 38% were not properly seat belted.
- 23 were incidents that occurred off-road, road-side, during vehicle maintenance, or that involved an employee hit as a pedestrian (non-occupant) on a job site; 8 of these 23 were ATV/UTV crashes.
- 9 were aircraft or railroad incidents; including the 2018 train crash that fatally injured two workers.

Prevention Opportunities
The priority issues highlighted by this report include increasing seat belt use across all sectors, increasing ATV and UTV safety, and reducing contact injuries and falls from height in the Construction industry. These topics should be prioritized for prevention efforts with various evidence-based strategies, including developing targeted outreach education and training, considering a primary seat belt law, expanding ATV and UTV rider safety training, and increasing use of free, state-supported safety consultation and improvement programs.

Non-fatal Occupational Injury Data
Data on non-fatal occupational injuries or illnesses are not included in this report. Current sources for these data include the U.S. Department of Labor Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII) and select reports from the DWS Research & Planning Section.1,2
Why Conduct State Occupational Fatality Surveillance?

According to the U.S. Department of Labor Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI), Wyoming consistently has one of the highest occupational fatality rates in the country. These federal data indicate that Wyoming experienced an average of 30 worker deaths per year during 2008-2018, an average rate of 11.2 per 100,000 full time equivalent workers (FTE) and one worker every 12 days. (Figure 1) This average rate is more than three times higher than the national average of 3.5 per 100,000 FTE during the same period. Wyoming has not experienced a sustained change in the annual rate of worker deaths since 2008. (Statistical fatality rates for Wyoming are not available prior to 2008.)

These federal CFOI data are recognized as the official statistical record of workplace fatality counts and rates for Wyoming and the United States. However, much of the federal data published for Wyoming do not contain sufficient detail to identify specific prevention strategies or priorities. For these reasons, the Department of Workforce Services (DWS) State Occupational Epidemiologist conducts independent surveillance to produce more detailed reporting of Wyoming workplace fatalities.

Figure 1: (Federal Data) Number and Rate of Fatal Occupational Injuries per 100,000 Full-Time Equivalent (FTE) Workers, Wyoming and the United States, 2008-2018


The remainder of this report describes state-collected data on occupational fatalities that occurred in Wyoming during 2012-2018. Data within this report may differ from previous state occupational fatality reports as case details and classifications are subject to change upon review or when new information becomes available. The information may also differ from the federal Census of Fatal Occupational Injuries (CFOI) numbers due to differing case classifications and access to data.

Wyoming State Occupational Epidemiology: Work-related Fatalities, 2012-2018
Page | 6
Results - Fatal Injuries 2012-2018

State vs. Federal Data

The Wyoming State Occupational Epidemiologist identified 27 work-related injury fatalities in 2018 and 189 total fatalities during the period 2012-2018 (Figure 2). Brief descriptions for each fatal injury identified are published on our website: wyomingworkforce.org/data/epidemiology/

The number of occupational injury fatalities in Wyoming identified by the state is up from 19 in 2017 to 27 in 2018. Compared to federal occupational fatality reporting, the state typically identifies slightly fewer deaths each year (Figure 2). This discrepancy is likely due to the federal program having expanded research capacity to identify and access fatality records from other states. It is possible that a worker could be injured in Wyoming, but die and have their death certificate registered in another state. If that worker’s employment was outside the scope of Wyoming Workers’ Compensation and Wyoming OSHA jurisdiction, there may not be a state record of the incident.

Confidentiality restrictions prohibit the federal CFOI program from sharing information with the state epidemiology program, making it difficult to realize all of the reasons for discrepancies between the systems. However, the state data and federal data do track similarly from year to year (Figure 2).

![Figure 2: Number of Fatal Occupational Injuries by Calendar Year, State Occupational Epidemiology and Federal Census of Fatal Occupational Injuries, Wyoming, 2012-2018](image)

Sources:

Event Type

Figure 3 provides an overview of state-identified occupational fatalities by general cause in Wyoming. Motor vehicle incidents accounted for 97 (51%) of all occupational fatalities during 2012-2018. This category includes commercial and private vehicle crashes during roadway travel, worksite or pedestrian-involved crashes, and railroad and aircraft crashes. The overall proportion of motor vehicle incidents identified by state epidemiology
(51%) aligns with the federal Census of Fatal Occupational Injuries (CFOI) data for Wyoming, which indicates that transportation incidents accounted for 49% of fatal occupational injuries during 2008-2018.\textsuperscript{3}

There was a notable increase in fatal work-related motor vehicle incidents in Wyoming, from 11 in 2017 to 15 in 2018, caused by an increase in roadway travel crashes and aviation/railroad incidents. (Figure 4) More information on these 2018 motor vehicle incidents can be found in the published case descriptions, including a train crash that caused two fatalities, the death of a commercial glider pilot, and several commercial vehicle crashes.

\textbf{Figure 3: Number of Fatal Occupational Injuries by General Event or Exposure Type and Year, Wyoming, 2012-2018 (N=189)}

\begin{center}
\includegraphics[width=\textwidth]{Figure3.png}
\end{center}

Source: Wyoming Department of Workforce Services, State Occupational Epidemiology

\textsuperscript{1} The federal CFOI definition for transportation incidents also includes roadway, aircraft and pedestrian incidents.
As described in the industry specific summaries later in this report, the burden and mix of event types was unique within different industries, such as 27% of construction-related deaths being attributed to a fall from height, and 28% of agriculture-related deaths being attributed to motor vehicle incidents involving an ATV or UTV crash, or non-occupant (pedestrian) struck by a moving vehicle.

**Age Group**

Figure 5 describes the percent of occupational fatalities by age group by year. Most workers fatally injured were between the ages of 25-64 (76%). Workers age 65 and older accounted for 16% of fatal occupational injuries, and workers younger than 25 years old accounted for 8%. These percentages generally correspond with Wyoming data published by the federal CFOI. While workers over age 65 accounted for 16% of fatalities during 2012-2018, this age group accounted for only about 6% of Wyoming’s workforce during the time, thus is over-represented in fatality incidents. Across the U.S. in 2018, workers age 65 and over experienced the highest rates of occupational fatality by age, more than double the all-worker rate (9.6 vs. 3.5 per 100,000 FTE). There is a body of evidence suggesting that, compared to younger workers, older workers have more severe occupational injuries and experience higher rates of workplace fatality.
The age distribution of occupational fatalities varies greatly by industry in Wyoming. (See Industry Summaries, p. 12-19) The Agriculture-related industries saw the highest proportion of workers age 65 and older fatally injured (31%), while the Construction and Mining industries (excluding oil & gas) saw none.

**Gender & Race**

During the period 2012-2018, 92% of all occupational fatalities identified were male and 8% were female. These percentages generally correspond with Wyoming data published by the federal CFOI.4

Data on race and ethnicity was only collected for the last four years (2015-2018). Since that time:

- 95% of all occupational fatalities were White, 3% were Black/African-American, 2% were other races, and race was unknown for 1%.
- 13% were Hispanic/Latino, 86% were non-Hispanic/Latino, and Hispanic ethnicity was unknown for 1%.

During 2015-2018, approximately 94% of the workforce in Wyoming was White, but only 9% was Hispanic/Latino, indicating workers of Hispanic/Latino ethnicity suffer a slightly disproportionate share of fatal occupational incidents.5

**Investigating Agency**

During the period 2012-2018, the Wyoming Occupational Safety and Health Administration (OSHA) had jurisdiction to fully investigate 57 (30%) of the 189 work-related fatalities. (Figure 6) The remainder of cases were under the reporting or investigation authority of the Wyoming Highway Patrol (n=65, 34%), local authorities (county coroners and local law enforcement) (n=49, 26%), the State Mines Inspector (n=6, 3%), or other agencies (n=12, 6%).

The category of Wyoming OSHA or State Mines was assigned if one of these two state regulatory programs had jurisdiction to conduct an on-scene investigation. These agencies do not have jurisdiction over every workplace or every cause of fatal injury, thus in combination, only had jurisdiction to inspect 33% of these fatal incidents.
occupational injuries during 2012-2018. The proportion of fatalities under OSHA jurisdiction each year during 2012-2018 has ranged from 26% to 37%. (Figure 7)

The category of Wyoming Highway Patrol (WHP) was assigned for any motor vehicle crash for which the crash was investigated by state or local law enforcement and recorded with the WHP, and WY OSHA or State Mines did not investigate. The category Other was assigned to cases where a federal regulatory agency investigated the death without state agency involvement, such as deaths investigated by the Federal Aviation Administration; these deaths were also likely investigated by local authorities.

**Figure 6: Summary of Occupational Fatalities by Investigating Agency of Record, Wyoming, 2012-2018**

<table>
<thead>
<tr>
<th>Investigating Agency</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wyoming Highway Patrol</td>
<td>65</td>
<td>34%</td>
</tr>
<tr>
<td>Wyoming OSHA</td>
<td>57</td>
<td>30%</td>
</tr>
<tr>
<td>Local Authorities</td>
<td>49</td>
<td>26%</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>6%</td>
</tr>
<tr>
<td>State Mines Inspector</td>
<td>6</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>189</strong></td>
<td><strong>99%</strong></td>
</tr>
</tbody>
</table>

*One percentage point lost due to rounding

**Source: Wyoming Department of Workforce Services, State Occupational Epidemiology**

**Figure 7: Percent of Occupational Fatalities by Investigating Agency of Record, Wyoming, 2012-2018**

Source: Wyoming Department of Workforce Services, State Occupational Epidemiology
**Location (County)**

During the period 2012-2018, Natrona County had the highest number of occupational fatalities (25), followed by Laramie (22), Sweetwater (18), and Campbell (17) Counties (Figure 8). County of death was unknown or identified to be out-of-state for 11 occupational fatalities during this time. Out-of-state deaths were included if they were the result of an in-state injury or exposure.

The distribution of occupational fatalities by county is likely explained by the underlying population density and high-risk industry activity in those areas. Laramie, Natrona, Campbell, and Sweetwater are the top four most populated counties in Wyoming.\(^{11}\) Among private sector employment, the Mining, Quarrying, and Oil and Gas Extraction industries (NAICS 21) employ the largest number of workers in Sweetwater, Campbell and Converse counties.\(^{12}\) This sector is the fifth largest employer in Natrona County, and is known to be associated with increased truck transportation and an itinerant (traveling) workforce.

Carbon County is less populated, but contains a significant stretch of Interstate Highway 80 and other roadways that cross mountain passes and experience severe weather impacting travel. Fifty percent (50%) of the fatalities in Carbon County during this period were due to roadway travel motor vehicle crashes, and 50% occurred among the Transportation and Warehousing industry. (Figure 9) Similarly, Converse and Platte Counties contain a long stretch of Interstate Highway 25. Fifty-seven percent (57%) of the fatalities in Converse County were due to roadway travel motor vehicle crashes, and 36% occurred among the Transportation and Warehousing industry. All eight of the occupational fatalities in Platte County were attributed to roadway travel crashes.

**Figure 8: Number of Fatal Occupational Injuries by County of Death, Wyoming, 2012-2018 (N=189)**

*Death Out of State or Unknown County = 11*

*Source: Wyoming Department of Workforce Services, State Occupational Epidemiology*
Figure 9: Prevailing* Event/Exposure and Industry of Fatal Occupational Injuries by Selected Counties, Wyoming, 2012-2018

<table>
<thead>
<tr>
<th>Selected County</th>
<th># Occupational Fatalities</th>
<th># Deaths - Event/Exposure</th>
<th># Deaths - Industry◊</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natrona</td>
<td>25</td>
<td>8 - Motor Vehicle (roadway travel)</td>
<td>8 - Oil &amp; Gas</td>
</tr>
<tr>
<td></td>
<td></td>
<td>6 - Contact with object/equipment</td>
<td>6 - Transportation</td>
</tr>
<tr>
<td>Laramie</td>
<td>22</td>
<td>9 - Motor Vehicle (roadway travel)</td>
<td>7 - Transportation</td>
</tr>
<tr>
<td>Sweetwater</td>
<td>18</td>
<td>No Prevailing Event/Exposure*</td>
<td>7 - Transportation</td>
</tr>
<tr>
<td>Campbell</td>
<td>17</td>
<td>7 - Motor Vehicle (pedestrian/worksite)</td>
<td>5 - Oil &amp; Gas</td>
</tr>
<tr>
<td>Carbon</td>
<td>14</td>
<td>7 - Motor Vehicle (roadway travel)</td>
<td>7 - Transportation</td>
</tr>
<tr>
<td>Converse</td>
<td>12</td>
<td>8 - Motor Vehicle (roadway travel)</td>
<td>5 - Transportation</td>
</tr>
<tr>
<td>Platte</td>
<td>8</td>
<td>8 - Motor Vehicle (roadway travel)</td>
<td>No Prevailing Industry*</td>
</tr>
</tbody>
</table>

* Prevailing, meaning accounted for at least five fatalities in the specified county during the time period.
◊ Notated with abbreviated titles.

Source: Wyoming Department of Workforce Services, State Occupational Epidemiology
**All Industries Summary**

The following page provides a summary of key elements for all 189 occupational injury fatalities identified by Wyoming State Occupational Epidemiology during the seven year period, 2012-2018.

- Most workers were male (92%) and residents of Wyoming (67%).
- State regulators (OSHA and State Mines) had jurisdiction to fully investigate 33% of these deaths.
- The leading causes of death were:
  - Roadway travel motor vehicle incidents (34%)
  - Motor vehicle incidents on a worksite or involving a pedestrian (non-occupant) (12%)
  - Contact with an object or equipment (17%)
  - Fall from height (10%)
**SUMMARY**

According to state epidemiology surveillance, 189 workers died as the result of on-the-job injury or acute exposure in Wyoming during the years 2012-2018. In these data, on average, 27 workers per year suffered fatal occupational injury.

Most workers were male (92%) and residents of Wyoming (67%). Wyoming OSHA had jurisdiction to fully investigate 30% of these deaths.

The leading causes of death were motor vehicle incidents during roadway travel (34%), on a worksite or involving a non-occupant pedestrian (12%), contact with an object or equipment (17%), and fall from height (10%).

### Of 189 Fatalities:
- 173 (92%) Male
- 126 (67%) Wyoming Residents
- **Jurisdiction**
  - 65 (34%) WHP
  - 57 (30%) OSHA
  - 49 (26%) Local Auth.
  - 12 (6%) Other
  - 6 (3%) State Mines

### Detailed Event/Exposure Type

<table>
<thead>
<tr>
<th>Detailed Event/Exposure Type</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact with object/equipment</td>
<td>33</td>
<td>17%</td>
</tr>
<tr>
<td>Exposure - drowning</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td>Exposure to harmful environments</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Exposure to harmful substances</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td>Fall (from height)</td>
<td>19</td>
<td>10%</td>
</tr>
<tr>
<td>Fall (same level)</td>
<td>3</td>
<td>2%</td>
</tr>
<tr>
<td>Fire/explosion</td>
<td>5</td>
<td>3%</td>
</tr>
<tr>
<td>Motor Vehicle Incident (aviation/railroad)</td>
<td>9</td>
<td>5%</td>
</tr>
<tr>
<td>Motor Vehicle Incident (roadway travel)</td>
<td>65</td>
<td>34%</td>
</tr>
<tr>
<td>Motor Vehicle Incident (pedestrian/worksite)</td>
<td>23</td>
<td>12%</td>
</tr>
<tr>
<td>Violence - suicide at work</td>
<td>9</td>
<td>5%</td>
</tr>
<tr>
<td>Violence or injury by animal</td>
<td>9</td>
<td>5%</td>
</tr>
<tr>
<td>Violence or injury by person</td>
<td>4</td>
<td>2%</td>
</tr>
<tr>
<td>Overexertion and bodily reaction</td>
<td>1</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>189</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

### MORE DETAIL ON LEADING EVENTS

- Of the 65 roadway travel incident deaths, **25 (38%) were not seat belted**. Seat belt use was unknown for 6 (9%).
- Of the 23 pedestrian/worksite motor vehicle incidents:
  - 8 – caused by ATV/UTV roll-overs or crashes
  - 4 – struck while working road-side
  - 4 – struck by backing vehicles
  - 3 – caused by vehicles rolling over them during maintenance
- Of the 19 falls from height, 5 fell from a roof, 5 fell from a stationary platform/scaffolding, 3 from a mobile platform/lift.

### Number of Fatalities by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>31</td>
</tr>
<tr>
<td>2013</td>
<td>21</td>
</tr>
<tr>
<td>2014</td>
<td>34</td>
</tr>
<tr>
<td>2015</td>
<td>30</td>
</tr>
<tr>
<td>2016</td>
<td>27</td>
</tr>
<tr>
<td>2017</td>
<td>19</td>
</tr>
<tr>
<td>2018</td>
<td>27</td>
</tr>
</tbody>
</table>
Industry Specific Summaries

The following pages provide an overview of occupational fatalities by select, high-risk industry group. Fatalities occurring within other industries (i.e. Education, Public Administration, etc.) are not summarized on one page due to high variability in the nature and cause of death, and the difficulty identifying common industry-based prevention strategies among such varied employment. However, the complete case descriptions for fatalities in all industries are provided on the DWS website: wyomingworkforce.org/data/epidemiology/

During the period 2012-2018, the Transportation and Warehousing industry accounted for the largest proportion of occupational fatalities in Wyoming (n=53, 28%), followed by the Agriculture, Forestry, Fishing and Hunting industry (n=32, 17%), the Oil & Gas Extraction and Production industry group (n=22, 14%), and the Construction industry (n=22, 12%). Manufacturing and Mining industries accounted for 7% of fatal occupational injuries during this time.

*Figure 10: Percent of Fatal Occupational Injuries by Selected Industries, Wyoming, 2012-2018*

![Figure 10: Percent of Fatal Occupational Injuries by Selected Industries, Wyoming, 2012-2018](image)

Source: Wyoming Department of Workforce Services, State Occupational Epidemiology

Occupational fatality numbers have been shown to rise and fall with the rise and fall of activity within certain high-risk industries, such as oil & gas extraction. Thus, the fluctuations in the annual state-wide and industry-specific fatality numbers may be associated with increasing or decreasing employment in Wyoming’s high-hazard industries. Even without a statistical adjustment for employment, conclusions can be made about leading causes and opportunities for intervention by industry. Each industry summary page below includes a summary of key findings and detailed information on the leading types of events observed within these industries.
SUMMARY
During 2012-2018, 32 workers were fatally injured in the Agriculture, Forestry, Fishing and Hunting industry in Wyoming. On average, 4-6 workers per year suffered fatal occupational injury in this industry. Most were male (91%), residents of Wyoming (94%), and age 55 or older (59%). This industry had the only death of a worker younger than 20 years old during this time period. Only seven (22%) of the 32 fatalities were under Wyoming OSHA jurisdiction for a complete fatality investigation. The leading causal events in this industry were motor vehicle incidents occurring on a worksite or involving a pedestrian (28%), contact with an object or equipment (25%), and injury by animal (22%).

Of 32 fatalities:
- 29 (91%) male
- 30 (94%) Wyoming residents
- Jurisdiction:
  - 7 (22%) OSHA
  - 1 (3%) WHP
  - 24 (75%) Local Authorities

<table>
<thead>
<tr>
<th>Detailed Event/Exposure Type</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact with object/equipment</td>
<td>8</td>
<td>25%</td>
</tr>
<tr>
<td>Exposure - drowning</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Exposure to harmful environments</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Exposure to harmful substances</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Fall (from height)</td>
<td>2</td>
<td>6%</td>
</tr>
<tr>
<td>Fall (same level)</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Fire/explosion</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Motor Vehicle Incident (aviation/railroad)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Motor Vehicle Incident (roadway travel)</td>
<td>1</td>
<td>3%</td>
</tr>
<tr>
<td>Motor Vehicle Incident (pedestrian/worksite)</td>
<td>9</td>
<td>28%</td>
</tr>
<tr>
<td>Violence - suicide at work</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Violence or injury by animal</td>
<td>7</td>
<td>22%</td>
</tr>
<tr>
<td>Violence or injury by person</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Overexertion and bodily reaction</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Total</td>
<td>32</td>
<td>100%</td>
</tr>
</tbody>
</table>

MORE DETAIL ON LEADING EVENTS
- ATV or UTV roll-overs or crashes accounted for seven of the nine (78%) worksite motor vehicle deaths.
- The leading events among workers fatally injured by animals were cow or bull encounters (four of the seven), and horse encounters (two of the seven).
- Among the four exposure deaths, one resulted from electrocution, one was caused by hazardous gases in a water treatment well, and the two drownings occurred in irrigation ditches or canals.
SUMMARY
During 2012-2018, 22 workers were fatally injured in the Construction industry in Wyoming. On average, three workers per year suffered fatal occupational injury in this industry. Most were male (95%), residents of Wyoming (91%), and all were of typical working age, between 20 to 64 years old. Sixteen (73%) of the 22 fatalities were under Wyoming OSHA jurisdiction for a complete fatality investigation. The leading causal events in this industry were contact with an object or equipment (36%), falls from height (27%), roadway travel motor vehicle incidents (18%), and motor vehicle incidents involving a pedestrian or occurring on a worksite (18%).

Of 22 fatalities:
- 21 (95%) male
- 20 (91%) Wyoming residents
- Jurisdiction:
  - 16 (73%) OSHA
  - 4 (18%) WHP
  - 2 (9%) Local Authorities

MORE DETAIL ON LEADING EVENTS
- Of the six falls from height, three fell from a stationary platform/scaffolding and two fell from a roof.
- Of the four pedestrian-involved or worksite motor vehicle crashes, two were struck by a backing vehicle, and one was struck by a moving vehicle while working on a road-side.
- Of the eight fatalities by contact with object/equipment, three occurred during the movement of material or equipment in a trench or excavated area, and two were the result of a trench cave-in.

Detailed Event/Exposure Type | Number | Percent
--- | --- | ---
Contact with object/equipment | 8 | 36%
Exposure - drowning | -- | --
Exposure to harmful environments | -- | --
Exposure to harmful substances | -- | --
Fall (from height) | 6 | 27%
Fall (same level) | -- | --
Fire/explosion | -- | --
Motor Vehicle Incident (aviation/railroad) | -- | --
Motor Vehicle Incident (roadway travel) | 4 | 18%
Motor Vehicle Incident (pedestrian/worksite) | 4 | 18%
Violence - suicide at work | -- | --
Violence or injury by animal | -- | --
Violence or injury by person | -- | --
Overexertion and bodily reaction | -- | --
Total | 22 | 100%

Number of Fatalities by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Count</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>6</td>
</tr>
</tbody>
</table>
Industry: Mining (excluding oil & gas)
2012-2018
Total Occupational Injury Deaths = 6

SUMMARY
During 2012-2018, six workers were fatally injured in non-oil and gas mining industries in Wyoming. On average, less than one worker per year suffered fatal occupational injury in these industries. All were male, most were residents of Wyoming (67%), and all were typical working ages between 20 and 54 years old. One fatality recorded in 2015 was the latent result of an injury that occurred in 2007. The Wyoming State Mine Inspector investigated all of the incidents at the time of injury. Motor vehicle incidents occurring on a worksite or involving a pedestrian were the leading causal event, accounting for half of all fatalities.

Of 6 fatalities:
➤ 6 (100%) male
➤ 4 (67%) Wyoming residents
➤ Jurisdiction
  ○ 6 (100%) State Mines

<table>
<thead>
<tr>
<th>Detailed Event/Exposure Type</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact with object/equipment</td>
<td>2</td>
<td>33%</td>
</tr>
<tr>
<td>Exposure - drowning</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Exposure to harmful environments</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Exposure to harmful substances</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Fall (from height)</td>
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<td>--</td>
</tr>
<tr>
<td>Fall (same level)</td>
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<td>--</td>
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<tr>
<td>Fire/explosion</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Motor Vehicle Incident (aviation/railroad)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Motor Vehicle Incident (roadway travel)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Motor Vehicle Incident (pedestrian/worksite)</td>
<td>3</td>
<td>50%</td>
</tr>
<tr>
<td>Violence - suicide at work</td>
<td>1</td>
<td>17%</td>
</tr>
<tr>
<td>Violence or injury by animal</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Violence or injury by person</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Overexertion and bodily reaction</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>100%</td>
</tr>
</tbody>
</table>

MORE DETAIL ON LEADING EVENTS
- Of the two contact with object/equipment deaths, one involved faulty equipment and lack of safety guards, and the other involved ineffective policies and procedures for conducting a hazardous task.
- Of the three motor vehicle incident deaths that occurred on a worksite or involved a pedestrian, two were operating equipment that rolled off an embankment, and one was struck by motorized equipment that was backing up.
SUMMARY
During 2012-2018, 27 workers were fatally injured in Oil & Gas Extraction and Production industries in Wyoming. **On average, 3-4 workers per year suffered fatal occupational injury in these industries.**

All workers were male, most were residents of Wyoming (70%). The largest proportion of deaths was in the 25-34 age group (30%). Wyoming OSHA had jurisdiction to fully investigate 11 (41%) of the incidents.

Roadway travel motor vehicle incidents were the leading causal events (48%), followed by contact with object or equipment (26%).

MORE DETAIL ON LEADING EVENTS
- Of the 13 roadway travel motor vehicle incident deaths, seven (54%) were not using a seat belt at the time of the crash and 8 occurred in passenger vans or pick-up trucks.
- Of the two pedestrian involved or worksite motor vehicle crashes, one was struck by a backing vehicle, and one was fatally injured by a vehicle that rolled while conducting maintenance underneath.
- Deaths by contact with an object/equipment were caused by various things, including the falling block of an oil rig, a tote that fell from a forklift, moving parts of a well pump, and a falling drill pipe.

Of 27 fatalities:
- 27 (100%) male
- 19 (70%) Wyoming residents
- Jurisdiction
  - 11 (41%) OSHA
  - 13 (48%) WHP
  - 3 (11%) Local Authorities

<table>
<thead>
<tr>
<th>Detailed Event/Exposure Type</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact with object/equipment</td>
<td>7</td>
<td>26%</td>
</tr>
<tr>
<td>Exposure – drowning</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Exposure to harmful environments</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Exposure to harmful substances</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Fall (from height)</td>
<td>1</td>
<td>4%</td>
</tr>
<tr>
<td>Fall (same level)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Fire/explosion</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td>Motor Vehicle Incident (aviation/railroad)</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Motor Vehicle Incident (roadway travel)</td>
<td>13</td>
<td>48%</td>
</tr>
<tr>
<td>Motor Vehicle Incident (pedestrian/worksite)</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td>Violence - suicide at work</td>
<td>2</td>
<td>7%</td>
</tr>
<tr>
<td>Violence or injury by animal</td>
<td>--</td>
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<tr>
<td>Violence or injury by person</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Overexertion and bodily reaction</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>27</td>
<td>100%</td>
</tr>
</tbody>
</table>

Number of Fatalities by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>3</td>
</tr>
<tr>
<td>2013</td>
<td>4</td>
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<tr>
<td>2014</td>
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<td>2015</td>
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<td>2016</td>
<td>4</td>
</tr>
<tr>
<td>2017</td>
<td>0</td>
</tr>
<tr>
<td>2018</td>
<td>3</td>
</tr>
</tbody>
</table>
SUMMARY
During 2012-2018, 53 workers were fatally injured in the Transportation and Warehousing industries in Wyoming. On average, 7-8 workers per year suffered fatal occupational injury in these industries.

Most were male (91%) and residents of other states (68%). Wyoming OSHA had jurisdiction to fully investigate six (11%) of the incidents. Thirty-six (68%) incidents were investigated by the highway patrol or local traffic officers.

Roadway travel motor vehicle incidents were the leading causal events (64%), followed by pedestrian or worksite incidents (8%), and fall from height (13%).

Of 53 fatalities:
- 48 (91%) Male
- 17 (32%) Wyoming Residents
- Jurisdiction
  - 6 (11%) OSHA
  - 36 (68%) WHP
  - 4 (8%) Local Authorities
  - 7 (13%) Other

MORE DETAIL ON LEADING EVENTS
- Of the 34 roadway travel motor vehicle incident deaths, 31 (91%) were drivers or passengers in heavy trucks (>26K pounds) and 12 (35%) were not using a seat belt at the time of the crash.
- Of the three falls from height, two had fallen from their trucks or trailers while securing loads or doing some other vehicle maintenance.
- Of the four workers fatally injured as non-occupants in motor vehicle crashes, three were struck by another vehicle while doing road-side maintenance or assistance work. One was chaining his truck when it rolled.

Number of Fatalities by Year

<table>
<thead>
<tr>
<th>Year</th>
<th>Fatalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>15</td>
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<tr>
<td>2013</td>
<td>4</td>
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<td>2014</td>
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<tr>
<td>2016</td>
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<tr>
<td>2017</td>
<td>8</td>
</tr>
<tr>
<td>2018</td>
<td>6</td>
</tr>
</tbody>
</table>
SUMMARY
During 2012-2018, seven workers were fatally injured in the Manufacturing industry in Wyoming; no deaths were identified in the most recent two year period. In prior years, most were male (71%), most were residents of Wyoming (86%). The largest proportion of deaths was in the 55-64 age group (three deaths, or 43%).

Wyoming OSHA had jurisdiction to fully investigate 7 (100%) of the incidents.

Contact with an object or equipment was the leading cause of death (57%), followed by fall from height (29%), and one roadway travel motor vehicle incident (14%).

Of 7 fatalities:
- 5 (71%) male
- 6 (86%) Wyoming residents
- Jurisdiction
  - 5 (71%) OSHA
  - 1 (14%) WHP
  - 1 (14%) Local Authorities

MORE DETAIL ON LEADING EVENTS
- Deaths by contact with an object/equipment were caused by various things, including entanglement in a vertical lathe, entrapment in a roller blade, and falling into machinery through an access hole.
- Of the two workers who fell from height, one fell from a roof and one from a stationary platform or scaffolding.
Discussion
According to the federal Census of Fatal Occupational Injuries (CFOI), there has been no consistent trend (down or up) in the annual number of occupational fatalities in Wyoming since 1992.\textsuperscript{15} Similarly, the annual rate of occupational fatalities in Wyoming has not shown any sustained change since 2008. (Figure 1) The purpose of this State Occupational Epidemiology annual report is to provide more detailed information on workplace fatalities in Wyoming to highlight prevention opportunities that are primed for uptake and could have the greatest impact on the overall burden.

Motor Vehicle Incidents
Motor vehicle incidents are a leading cause of occupational death in Wyoming and the nation. These incidents accounted for 97 (51\%) of all fatalities identified by the state during 2012-2018. This is comparable to the federal CFOI, which reported 49\% of Wyoming fatalities as transportation incidents\textsuperscript{ii} during 2012-2018. Although this category includes a variety of transportation modalities and scenarios, roadway travel vehicle crashes are the primary contributor, accounting for 65 of the 97 state-identified fatalities in this category (67\%), and 34\% of all fatal occupational injuries in Wyoming during 2012-2018.

Of the 65 roadway travel motor vehicle incidents identified in this report, 38\% were not restrained with a seat belt. This proportion of unbelted fatalities is smaller than is typically observed for all motor vehicle crash fatalities in Wyoming, which averaged 59\% unbelted during 2015-2019.\textsuperscript{16} However, this observation indicates a significant opportunity to improve seat belt use rates among the traveling workforce in Wyoming, and thus help prevent occupational motor vehicle crash deaths.

Roadway travel motor vehicle incidents accounted for 64\% of all occupational fatalities in the Transportation and Warehousing sector. Most of these occurred in heavy-truck vehicles.

Roadway travel motor vehicle incidents also accounted for 48\% of all occupational fatalities in the Oil & Gas Extraction and Production sector. Of the 13 fatalities in this category, eight occurred in pick-up trucks or passenger vans. This is consistent with findings from the National Institute for Occupational Safety and Health (NIOSH) Fatalities in Oil and Gas Extraction (FOG) surveillance program, which has identified motor vehicle travel as a leading cause of workplace death in the industry nation-wide.\textsuperscript{17} Though the causes of these crashes are varied and may include the unsafe actions of drivers in other vehicles, state-wide oil and gas industry partners should continue to recognize this occupational hazard and seek opportunities to improve these outcomes with policies and programs that support driver safety.

The category of “motor vehicle incident - pedestrian/worksite” includes incidents involving all-terrain vehicles (ATV) and utility terrain vehicles (UTV). During the period 2012-2018, there were eight work-related ATV or UTV crashes resulting in death in Wyoming; seven of these (88\%) occurred in the Agriculture-related industries, primarily within ranching operations. Existing data sources for these off-road crashes do not systematically capture potentially relevant information, such as rider experience and training, vehicle size and power, and use of personal protective equipment. Additional study and investigation of these deaths is needed to fully understand causal trends and associations.

\textsuperscript{ii} The federal CFOI definition for transportation incidents also includes roadway, aircraft and pedestrian incidents.
**Trenching & Falls**

Wyoming’s Construction industry experienced a notable increase in fatalities, from two in 2017 to six in 2018. Past annual reports have shown falls from height as the leading cause of injury death among construction workers in Wyoming. However, this update through 2018 revealed contact injuries as the leading cause since 2012, accounting for eight (36%) of all fatal injuries in the construction industry. Trenching incidents accounted for the majority of these contact injury deaths, including contact with industrial equipment or material during trench operations as well as trench cave-ins. Falls from height remained the second leading cause of fatal occupational injury among construction workers, accounting for six (27%) of these incidents.

Nationally, in 2018 contact injuries accounted for 17% of all worker deaths in construction, while falls from height accounted for 32%. Fall-related and trenching operation injuries are preventable with readily accessible training and education resources and widely available safety and protective equipment.

**Outreach & Inspection**

Although 67% of all occupational fatalities during 2012-2018 were Wyoming residents, this trend varied by industry. More Agriculture-related and Construction industry deaths were in-state residents (94% and 91%, respectively), compared to only 32% of Transportation and Warehousing industry deaths. These findings suggest localized prevention efforts for agriculture and construction would reach the appropriate workers and employers, while fatal injury prevention strategies for truck transportation should be tailored to reach incoming out-of-state drivers.

Similarly, state regulator jurisdiction varied greatly by industry. One-hundred percent of fatal injury events in the non-oil and gas Mining sector were inspected by the Wyoming State Mines Office. Wyoming OSHA jurisdiction, which can be limited by industry and also cause (See the companion Methods document), was far-reaching in some sectors (e.g. Construction with 73% inspected), but more limited in others (e.g. Agriculture with 22% inspected), overall reaching 30% of workplace injury fatalities identified in this report. It is important to understand these jurisdictional limitations of our state regulators because the result is often a lack of investigative information on many factors that influence safety behavior and decisions. Information such as employer policies, worker training, routine safety practices, and equipment functionality are often not included in other sources of information. This information gap makes it difficult to fully understand the underlying issues and causes of many of the incidents in this report. Additionally, research suggests that workplace compliance inspections improve workplace safety outcomes (as measured by workers’ compensation claims), thus should be considered an important component of workplace injury prevention.

**Opportunities for Prevention**

Considering the aforementioned burdens and trends, the following opportunities are recommended to prevent fatal occupational injuries in Wyoming:

- Wyoming has the opportunity to enact a state-wide primary seat belt law. There is a long record of evidence that seat belts save lives and reduce traumatic injury in the event of a crash, that primary seat belts laws increase use of safety restraints among passengers and drivers, and that states that have primary seat belt laws have lower rates of motor vehicle crash fatalities than those with only secondary

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Wyoming currently has a secondary seat belt law, meaning that law enforcement may issue a ticket for not wearing a seat belt only when the driver has been stopped for another citable traffic infraction.
laws. Uptake of this state-wide policy could feasibly reduce motor vehicle crash deaths among resident and non-resident traveling workers.

- Efforts should continue to improve workplace ATV/UTV safety in Wyoming, especially in agriculture. In addition to increasing education and voluntary training opportunities, as has recently been done through the University of Wyoming Extension, efforts could consider state laws that may have impact, such as required safety training for new operators, use of helmets and possible age restrictions. Examples of such policies are tracked by the national ATV Safety Institute.

- Every employer in the state should have a current health and safety program that includes the minimum core elements recommended by OSHA. These core elements can be scaled up or down to fit each employer’s unique situation, and cross-walked with recommendations set forth by OSHA or other health and safety organizations. Some states have legislation requiring safety and health programs for certain employers; this approach could be considered in Wyoming.

  - Two state-run programs, OSHA Consultation and Workers’ Compensation Safety and Risk, provide free and confidential assistance to help employers identify needs for their health and safety programs. The Wyoming State Mines Office can assist mining operations in safety training and information.

  - Wyoming employers that have written health and safety programs may be eligible for premium discounts on workers’ compensation premiums. During state fiscal year 2018, 201 of the approximately 16,000 employers registered with Wyoming Workers’ Compensation were enrolled in this discount program. Employers can register for this program through the Wyoming Department of Workforce Services (DWS) Risk Management Program.

- Wyoming employers should also continue accessing the Safety Improvement Fund, which provides grants for procuring safety equipment and training and is available through DWS Risk Management. This resource is a unique benefit to Wyoming employers and has successfully funded equipment or training to address occupational fatality hazards, including fall protection equipment, equipment to enhance communication or visibility on worksites, and equipment and training to improve driver safety.

- Industry safety alliances and other workplace safety stakeholder groups should use the information in this report, and the associated fatality incident descriptions, to identify and understand trends and common causes within their industries and workforces. This information can be used to inform efforts for industry training, outreach education and employer-based or state-wide policy development.

- Finally, efforts should continue to expand surveillance and research of occupational injuries, with a focus on fatal and severe injuries. More data is essential to accurately characterize the burden, causes and contributing factors, and to inform prevention strategies in all sectors.

**Conclusion**

The data in this report are intended for health and safety professionals, policy makers, industry safety partners, and others interested in better understanding the trends and burden of fatal occupational injuries occurring in Wyoming. Although many occupational safety best-practices are universal, the deployment and uptake of those best practices varies by industry. This underscores the need for Wyoming’s industry safety alliances and state safety partnerships to remain active and engaged in efforts to identify and act on opportunities to reduce occupational fatalities. The Wyoming State Occupational Epidemiology program is an active participant in this work, along with numerous other DWS safety professionals, public health and community partners.
References

17. U.S. Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health (NIOSH). Fatalities in Oil and Gas Extraction (FOG) Program. Table #9: Activity being conducted when worker was fatally injured as captured in FOG, 2015–2016. Available: https://www.cdc.gov/niosh/topics/foq/data.html


Hoye A. How would increasing seat belt use affect the number of killed or seriously injured light vehicle occupants? Accident Analysis & Prevention. 2016 Mar; 88: 175-186.


