BEYOND THE NUMBERS

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WORKPLACE INJURIES

Injuries, illnesses, and fatal injuries in mining in 2010

Author: Sean Smith, Office of Compensation and Working Conditions

Fatal injuries in the mining industry declined throughout the 20th century. From 1900 to 1945 there were more than 1,000 fatal injuries every year in coal mining alone, according to the U.S. Department of Labor Mine Safety and Health Administration (MSHA).[1] Since the U.S. Bureau of Labor Statistics (BLS) began collecting fatal injury data in 1992, there have been no more than 60 fatal injuries in coal mining in any given year, and fewer than 200 fatal injuries per year for all workers in the mining industry as a whole. Despite such improvements, fatal injury rates in mining remain more than four times higher than the average for all industries, and high-profile accidents continue to make headlines. The explosion in the Upper Big Branch coal mine in West Virginia in April 2010 took the lives of 29 workers, which was more than the total number of fatal injuries in coal mining in 2009.[2] Also in April 2010, an explosion and fire on the Deepwater Horizon offshore oil drilling platform in the Gulf of Mexico killed 11 workers. In total, there were 172 fatal work injuries in the mining industry during 2010.

Related articles

More BLS articles and information related to workplace injuries are available online at the following links:

- "Coal Mining Injuries, Illnesses, and Fatalities in 2006," *Compensation and Working Conditions*, **www.bls.gov/opub/cwc/sh20080623ar01p1.htm**.
- "Facts of the catch: occupational injuries, illnesses, and fatalities to fishing workers, 2003–2009," *Beyond the Numbers*, **http://www.bls.gov/opub/btn/volume-1/facts-of-the-catch-occupational-injuries-illnesses-and-fatalities-to-fishing-workers-2003-2009.htm**.

In addition to the fatal work injuries, there were 15,500 recordable nonfatal injuries and illnesses in the mining industry during 2010, a rate of 2.3 incidents per 100 full-time workers. The number of nonfatal injuries and illnesses in the mining industry declined 12.4 percent from 2009.

In 1977, Congress passed the Federal Mine Safety and Health Act (Mine Act) with the goals of consolidating existing regulations on mine safety and health, improving compliance, and keeping pace with innovations in the mining industry. MSHA was created in 1978 to administer the provisions of the act and to oversee mine safety and health. According to the Mine Act, "The first priority and concern of all in the coal or metal and nonmetal mining industry must be the health and safety of its most precious resource—the miner."[3]

The mining industry sector includes such subsectors as oil and gas extraction, coal mining, metal ore mining, nonmetallic mineral mining and quarrying, and support activities for mining. In the early 1980s, the mining industry employed more than a million workers. After two decades of decline, only half that number worked in the mining industry in 2003. Since then, employment in the industry has seen a resurgence, with 654,800 workers in 2010 according to the BLS Current Employment Statistics program.[4] The support activities subsector of the mining industry includes establishments that specialize in drilling, exploration, taking core samples, and making geological observations. Mining support activities is the largest segment of the mining industry, with 44.5 percent of employment, followed by oil and gas extraction, with 24.2 percent.

Nonfatal injury and illness data for establishments in support activities for mining and oil and gas extraction are collected by the BLS Survey of Occupational Injuries and Illnesses (SOII).[5] Nonfatal injury and illness data for coal mining, metal ore mining, and nonmetallic mineral mining and quarrying are provided to BLS by MSHA. The data collected by MSHA do not reflect the January 2002 recordkeeping requirements instituted by the Occupational Safety and Health Administration (OSHA), which makes comparisons between industries problematic.[6] Fatal injury data are collected by the BLS Census of Fatal Occupational Injuries (CFOI).[7] The scope of coverage differs between SOII and CFOI. The SOII excludes self-employed workers, farms with fewer than 11 employees, and federal government employees. The CFOI includes only fatal injuries; illness-related deaths are excluded unless precipitated by an injury event.

Fatal injuries

A total of 172 workers were killed on the job in the mining industry in 2010. This represents a 72.0-percent increase from the 100 fatal injuries reported in 2009. The fatal injury rate rose to 19.8 per 100,000 equivalent full-time workers in 2010, up from 12.4 in 2009. Mining had the second-highest fatal injury rate among industry sectors, behind only the agriculture, forestry, fishing and hunting sector. The fatal injury rate for mining was more than five times higher than the figure for all private industry (3.6 fatal injuries per 100,000 full-time workers). Beginning with 2006 data, CFOI has reported fatal injury rates based on hours worked in addition to rates based on employment. The hours-based rate is generally considered more accurate.[8]

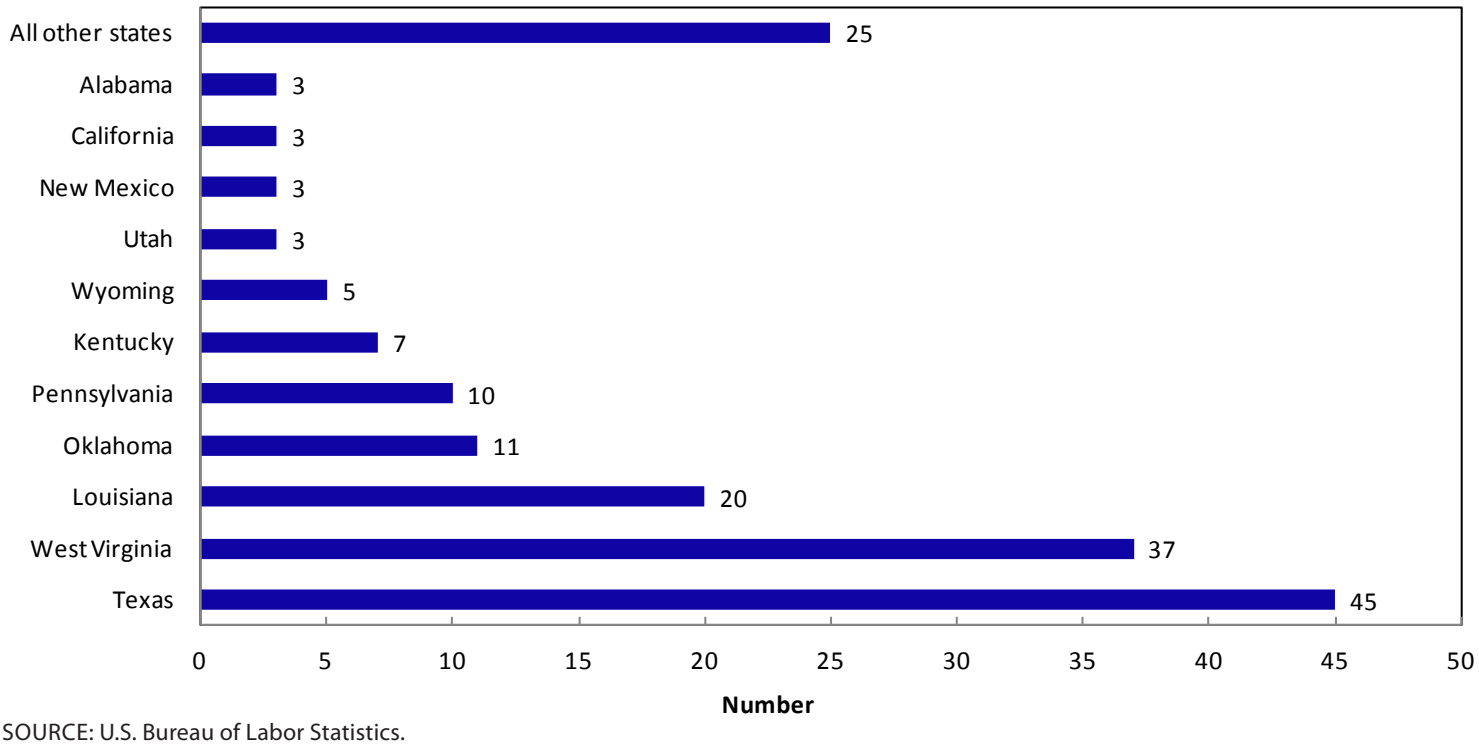
Incidents resulting in multiple fatal injuries are much more prevalent in mining than in other industries. In coal mining, 72.1 percent of the cases were part of multiple fatal injury incidents, compared with 26.7 percent in mining overall, and 8.6 percent for all industries.

In 2010, Texas had 45 fatal injuries in the mining industry, the most of any state. The states with the next highest number of fatal mining injuries were West Virginia (37 in total, 29 of which were from a single incident), and Louisiana (20). (See chart 1.) Nine of the fatal injuries in the mining industry resulted from the Deepwater Horizon explosion. In total, 11 workers suffered fatal injuries in that incident; nine of those killed were employed by establishments in the mining industry, and the two contractors who died were recorded by the industry of their employer.

Rescue workers who are killed in a mining incident may not be included in the total number of deaths for the mining industry. For example, if a paramedic responding to a mining incident is killed, this fatal injury may be counted in the healthcare or fire protection industry, depending on the employer, instead of the mining industry.

Chart 1

Fatal occupational injuries in the mining industry sector, by state, 2010 (172 total)



SOURCE: U.S. Bureau of Labor Statistics.

Most of those fatally injured in the mining industry in 2010 were wage and salary workers (96.5 percent). The remaining workers were self-employed. The majority of the fatally injured were White, non-Hispanic workers (82.6 percent), while Hispanics accounted for 14.5 percent of mining fatal injuries. Almost all of the fatally injured workers were male (98.8 percent).

Among those killed on the job in the mining industry, 58.1 percent were working in support activities for mining. Another 25.0 percent were employed in coal mining, and 7.0 percent worked in oil and gas extraction industries.

Construction and extraction occupations accounted for 62.2 percent of fatally injured workers in the mining industry, and 21.5 percent were employed in transportation and material moving occupations, the group that includes truck drivers. (See table 1.)

Fires and explosions were the leading event or exposure contributing to fatal injuries in the mining industry, making up 32.6 percent of the total. In the industry as a whole, 29.7 percent were killed as a result of transportation incidents, and 23.8 percent of fatal injuries resulted from contact with objects and equipment. In coal mining, fires and explosions were responsible for 69.8 percent of the fatal injuries, while transportation incidents (38.0 percent) were the leading events or exposures in support activities for mining. (See table 2.)

Nonfatal injuries and illnesses

In 2010, there were 15,500 recordable injuries and illnesses in the mining industry, a 12.4-percent decrease from the 2009 total of 17,700. The total recordable case rate of injuries and illnesses was 2.3 per 100 full-time workers in 2010. (See table 3.) The rate was 3.5 for all private industry. In the mining industry, the incidence rate for cases with days away from work was 1.0, and the rate for cases with job transfer or restriction was 0.4. For private industry, the rate for cases with days away from work was 1.1 and the rate for cases with job transfer or restriction was 0.8.

There were 6,910 cases involving days away from work reported in the mining industry during 2010. The median number of days away from work in these cases was 24,

Table 1

Fatal occupational injuries and nonfatal days-away-from-work cases in the mining industry sector, by occupation, 2010

Occupation	Fatal injuries		Nonfatal days-away-from-work cases	
	Number	Percent	Number	Percent
Total	172	100.0	6910	100.0
Construction and extraction occupations	107	62.2	3780	54.7
First-line supervisors	18	10.5	270	3.9
Derrick operators, oil and gas	6	3.5	230	3.3
Rotary drill operators, oil and gas	7	4.1	140	2.0
Continuous mining machine operators	8	4.7	110	1.6
Mining machine operators, all other	12	7.0	270	3.9
Roof bolters, mining	6	3.5	360	5.2
Roustabouts, oil and gas	6	3.5	300	4.3
Helpers, extraction workers	6	3.5	120	1.7
Extraction workers, all other	26	15.1	1560	22.6
Installation, maintenance, and repair occupations	10	5.8	710	10.3
Industrial machinery mechanics	3	1.7	530	7.7
Production occupations	8	4.7	640	9.3
Welders, cutters, solderers, and brazers	4	2.3	160	2.3
Crushing, grinding, and polishing machine setters, operators, and tenders	–	–	210	3.0
Production workers, all others	–	–	190	2.7
Transportation and material moving occupations	37	21.5	1340	19.4
Truck drivers, heavy and tractor-trailer	23	13.4	500	7.2
Laborers and freight, stock, and material movers, hand	–	–	170	2.5
Truck drivers, heavy and tractor-trailer	23	13.4	500	7.2

NOTE: Dashes indicate no data reported or data that do not meet publication criteria.
SOURCE: U.S. Bureau of Labor Statistics.

which was three times as long as the days-away-from-work cases in private industry. In the mining industry, 42.8 percent of days-away-from-work injuries required 31 or more days to recuperate, compared with 27.5 percent for all private industry.

Among the days-away-from-work cases in the mining industry, 43.4 percent resulted from contact with an object or equipment, and another 26.3 percent were the result of overexertion. In contrast, 25.8 percent of day-away-from-work cases in all private industry were the result of contact with an object or equipment. In the mining industry, the most common sources of injury or illness were floors and ground surfaces (17.8 percent), parts and materials (16.9 percent), and machinery (11.0 percent).

In the mining industry, sprains, strains, and tears accounted for 37.5 percent of the nonfatal injuries and illnesses. Fractures (17.5 percent) and bruises and contusions (8.8 percent) also were among the leading natures of injury or illness. In contrast, the share for fractures for all private industry was 7.4 percent. In 32.9 percent of the mining industry cases, the trunk (which includes the back) was the affected body part. Another 25.6 percent of the cases involved lower extremities, such as knees, ankles, and feet, and 21.1 percent involved upper extremities, such as the arm, hand, and finger. (See table 4.)

The majority of mining workers who experienced an injury or illness that required days away from work were employed in construction and extraction occupations (54.7 percent), with jobs such as operators of drills and other mining machinery. Transportation and material moving occupations accounted for 19.4 percent of the mining industry's nonfatal day-away-from-work cases, followed by installation,

Table 2

Fatal occupational injuries in mining, by industry and event or exposure, 2010

Event or exposure	Mining	Oil and gas extraction	Coal mining	Metal ore mining	Nonmetallic mineral mining and quarrying	Support activities for mining
All Events or exposures	172	12	43	6	11	100
Contact with objects and equipment	41	–	8	–	7	23
Struck by object or equipment	25	–	5	–	–	16
Struck by falling object or equipment	19	–	5	–	–	11
Caught in or compressed by equipment or objects	13	–	3	–	4	5
Caught in running equipment or machinery	7	–	–	–	3	3
Falls	10	–	–	–	–	7
Fall to lower level	9	–	–	–	–	6
Exposure to harmful substances or environments	11	3	–	–	–	7
Contact with electric current	3	–	–	–	–	3
Exposure to caustic, noxious, or allergenic substances	3	–	–	–	–	–
Oxygen deficiency (including drowning)	3	–	–	–	–	–
Transportation incidents	51	5	5	–	–	38
Highway incidents	40	3	–	–	–	35
Collision between vehicles, mobile equipment	17	–	–	–	–	15
Noncollision incidents	13	–	–	–	–	12
Nonhighway incident, except rail, air, water	4	–	–	–	–	–
Pedestrian struck by vehicle, mobile equipment	5	–	4	–	–	–
Fires and explosions	56	3	30	–	–	22
Fire, unintended or uncontrolled	37	–	30	–	–	7
Explosion	19	3	–	–	–	15

NOTE: Dashes indicate no data reported or data that do not meet publication criteria.

SOURCE: U.S. Bureau of Labor Statistics.

Table 3

Rate of injuries and illnesses in the mining industry sector, 2009 and 2010

Characteristic	Incidence rate		Significant change[1]
	2009	2010	
Total cases	2.4	2.3	not significant
Cases with days away from work, job transfer, or restriction	1.5	1.4	not significant
Cases with days away from work[2]	1.1	1.0	not significant
Cases with job transfer or restriction	0.4	0.4	not significant
Other recordable cases	1.0	0.9	not significant

1. At 95 percent confidence level.
2. Days-away-from-work cases include those that result in days away from work with or without job transfer or restriction.

SOURCE: U.S. Bureau of Labor Statistics.

maintenance, and repair occupations with 10.3 percent, and production occupations with 9.3 percent. (See table 1.)

Because the mining industry consists of varied sectors, safety and health incidents vary from one sector to the next. Among the different components of the mining industry, several data highlights on nonfatal injuries and illnesses in 2010 stand out:

- *Support activities for mining.* Fractures accounted for 19.2 percent of the days-away-from-work cases. In 22.6 percent of the cases, the worker had been employed for less than 3 months. Of the cases where the number of hours worked before the injury were reported, 27.5 percent of the injured or ill workers had worked more than 8 hours. For all of private industry, 12.4 percent of the injured or ill workers had worked more than 8 hours.
- *Oil and gas extraction.* The total recordable case rate for oil and gas extraction was 1.2 per 100 full-time workers, while the rate for the mining industry as a whole was 2.3. The rate for days-away-from-work cases per 100 full-time workers was 0.5. Of the injured or ill workers, 49.3 percent were employed in construction and extraction occupations.
- *Coal mining.* Coal mining had 3.9 recordable injuries and illnesses per 100 full-time workers, and a rate of 2.3 cases with days away from work. More than 50 percent of days-away-from-work cases in coal mining required 31 or more days to recuperate.
- *Metal ore mining.* The injuries and illnesses in this industry sector required a median of 27 days away from work. The percentage of days-away-from-work injuries experienced by female workers was 8.8 percent. For

Table 4

Number of nonfatal occupational injuries and illnesses involving days away from work[1] by selected case characteristics in the mining industry sector in the United States, private industry, 2010

Characteristic	Private industry[2]		Mining	
	Count	Percent	Count	Percent
Total	933,200	100.0	6,910	100.0
Nature of injury or illness				
Sprains, strains	370,130	39.7	2,590	37.5
Fractures	69,380	7.4	1,210	17.5
Cuts, lacerations, punctures	79,120	8.5	460	6.7
Cuts, lacerations	69,800	7.5	370	5.4
Bruises, contusions	76,960	8.2	610	8.8
Part of body affected				
Head	61,830	6.6	450	6.5
Trunk	310,400	33.3	2,270	32.9
Back	185,270	19.9	1,050	15.2
Shoulder	68,040	7.3	680	9.8
Upper extremities	209,600	22.5	1,460	21.1
Arm	42,550	4.6	260	3.8
Finger	75,440	8.1	750	10.9
Lower extremities	212,080	22.7	1,770	25.6
Knee	82,980	8.9	710	10.3
Foot, toe	40,060	4.3	380	5.5
Multiple	104,020	11.1	750	10.9

See footnotes at end of table.

Table 4—Continued

Number of nonfatal occupational injuries and illnesses involving days away from work[1] by selected case characteristics in the mining industry sector in the United States, private industry, 2010

Characteristic	Private industry[2]		Mining	
	Count	Percent	Count	Percent
Source of injury or illness				
Chemicals, chemical products	13,600	1.5	440	6.4
Containers	112,880	12.1	720	10.4
Machinery	52,320	5.6	760	11.0
Parts and materials	78,990	8.5	1,170	16.9
Person, injured or ill worker	136,710	14.6	290	4.2
Worker motion or position	128,230	13.7	270	3.9
Floor, ground surfaces	193,910	20.8	1,230	17.8
Handtools	42,140	4.5	430	6.2
Vehicles	77,300	8.3	530	7.7
Event or exposure				
Contact with object, equipment	241,160	25.8	3,000	43.4
Struck by object	119,130	12.8	1,560	22.6
Struck against object	67,170	7.2	630	9.1
Caught in object, equipment, material	41,040	4.4	760	11.0
Fall to lower level	59,440	6.4	390	5.6
Fall on same level	139,660	15.0	780	11.3
Overexertion	223,970	24.0	1,820	26.3
Overexertion in lifting	112,170	12.0	770	11.1

1. Days-away-from-work cases include those that result in days away from work with or without job transfer or restriction.
2. Excludes farms with fewer than 11 employees.

Data for mining (Sector 21 in the North American Industry Classification System–United States, 2002) include establishments not governed by the Mine Safety and Health Administration (MSHA) rules and reporting, such as those in oil and gas extraction and related support activities. Data for mining operators in coal, metal, and nonmetal mining are provided to BLS by the Mine Safety and Health Administration, U.S. Department of Labor. Independent mining contractors are excluded from the coal, metal, and nonmetal mining industries. These data do not reflect the changes the Occupational Safety and Health Administration made to its recordkeeping requirements effective January 1, 2002; therefore estimates for these industries are not comparable to estimates in other industries.

Data for employers in railroad transportation are provided to BLS by the Federal Railroad Administration, U.S. Department of Transportation. These data do not reflect the changes the Occupational Safety and Health Administration made to its recordkeeping requirements effective January 1, 2002; therefore estimates for these industries are not comparable to estimates in other industries.

NOTE: Because of rounding and data exclusion of nonclassifiable responses, data may not sum to the totals. The scientifically selected probability sample used was one of many possible samples, each of which could have produced different estimates. A measure of sampling variability for each estimate is available upon request.

SOURCE: U.S. Bureau of Labor Statistics, U.S. Department of Labor.

all mining industries, female workers experienced 1.7 percent of the days-away-from-work injuries.

- *Nonmetallic mineral mining and quarrying.* Among the injured employees with days-away-from-work cases in this industry, 43.7 percent had been on the job for at least 5 years. For the mining industry overall, this rate was 23.3 percent. Days-away-from-work injuries and illnesses required a median of 15 days to recover. In this sector, 33.3 percent of the injuries involved overexertion. In all mining industries, 26.3 percent involved overexertion.

Conclusion

Workers in the mining industry continue to face a higher risk of fatal injury than average American workers.

Although the rate of nonfatal injuries and illnesses in mining is less than the average reported for private industry, these injuries are often of a severe nature, as evidenced by the higher median days away from work. Fires and explosions were the leading causes of workplace fatal injuries. Contact with objects and equipment was the leading cause of nonfatal injuries and illnesses. ■

This **BEYOND** THE **NUMBERS** report was prepared by Sean Smith, economist in the Office of Compensation and Working Conditions. Email: **smith.sean@bls.gov**. Telephone: 202-691-6187.

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Notes

1. The U.S. Mine Safety and Health Administration lists year-by-year fatality totals for the coal mining industry for the years 1900 to 2010. For more information, the table is available here: **http://www.msha.gov/stats/centurystats/coalstats.asp**.
2. The U.S. Mine Safety and Health Administration provides a page with information related to the Upper Big Branch mine explosion of April 2010: **http://www.msha.gov/PerformanceCoal/PerformanceCoal.asp**.
3. "U.S. Mine Safety and Health Administration: 25 Years of Success," (U.S. Department of Labor, 2003), **http://www.msha.gov/MSHAInfo/25Years/MSHA%2025%20Years.pdf**.
4. U.S. Bureau of Labor Statistics, Current Employment Statistics Program. To view data from this program visit the CES website: **http://www.bls.gov/ces/**.
5. Data on fatal injuries are from the Bureau of Labor Statistics, **Census of Fatal Occupational Injuries (CFOI)**. Fatal injuries in this study are based on revised counts for 2010. Data on nonfatal injuries and illnesses are from the **Survey of Occupational Injuries and Illnesses (SOII)** program, which collects data from a sample of business establishments in the United States. For more information on both the CFOI and SOII programs, see "Chapter 9, Occupational safety and health statistics," in **BLS Handbook of Methods**, available at : **http://www.bls.gov/opub/hom/pdf/homch9.pdf**. The **Injuries, Illnesses, and Fatalities (IIF)** program uses the **Occupational Injury and Illness Classification System (OIICS)** to define event or exposure, nature, part of body, and source. Occupation is defined using the **Standard Occupational Classification (SOC)** system, and industry is defined using the **North American Industrial Classification System (NAICS)**.
6. Information on OSHA's recordkeeping rules can be found on OSHA's website: **http://www.osha.gov/recordkeeping/index.html**.
7. Refer to endnote 5 for more information.
8. For a comparison of employment based fatal injury rates to hours based rates, see Joyce Northwood, "Change to Hours-Based Fatality Rates in the Census of Fatal Occupational Injuries," (U.S. Bureau of Labor Statistics, January 2010), **http://www.bls.gov/opub/cwc/sh20100121ar01p1.htm**.

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