State and Industry Fatal Occupational Injuries, 1992-96

While industry mix explains part of the variation in fatality risk among States, other factors can play a role.

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Thirty-two thousand workers were fatally injured in the United States during the period 1992-96. The following aggregation shows the 7 States that had fatality counts of 1,000 or more. These deaths accounted for about two-fifths of the Nation's work related fatalities.[1]

	Number	Percent
Total	31,567	100
California	3,185	10
Texas	2,551	8
Florida	1,756	5
New York	1,642	5
Pennsylvania	1,352	4
Illinois	1,261	4
Georgia	1,133	4

With the exception of Georgia, the 7 States also had the largest employment counts. But there are factors other than employment counts that influence the number of fatal work injuries in a State. Some of these include industrial and demographic composition of the workforce, weather conditions and geography, and the availability of emergency medical services.

State fatality rates, 1992-96[2]

One way to compare occupational fatality risk among States is to compare their fatal work injury rates. State fatality rates can fluctuate widely from year-to-year because fatalities at work are relatively rare events. For this reason, and to lessen the effect of catastrophic events, such as the Oklahoma City bombing or airline crashes which can skew the analysis of State-specific data, 5 years of data were used for this analysis.

State fatal work injury rates varied from a low of 2.0 per 100,000 workers in New Hampshire to a high of 22.9 in Alaska over the 1992-96 period. The District of Columbia and 29 States had rates above the national rate of 5.1. The median rate, the rate half the States were above and half were below, was 5.4. (See table 1.)

To compare fatality risk among the States, quartile grouping, distributing States into four groups according to their fatality rates, was used.[3] (See chart.) States in quartiles 1 and 2, the States with the lowest fatality rates, were concentrated in the New England, Mid-Atlantic, Great Lakes, and Pacific regions. The States with the highest rates, quartiles 3 and 4, were concentrated in the Southern, Mountain, and Plains regions.

Industry's influence on fatality risk[4]

States' different industry mixes can explain some of the fatality rate variation among them. Nationally, the mining, agriculture, construction, and

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Table 1. Fatal occupational injury rate per 100,000 civilian workers[1] by State and industry division, 1992-96

| State | Fatality rate | Private industry | | | | | | | | Government[5] (Federal, State, and local) |
		Agriculture[2]	Mining[3]	Construction[3]	Manufacturing[3]	Transportation and public utilities[3]	Trade[3]	Finance, insurance, real estate[3]	Services[4]	
All States[6]	5.1	21.9	26.4	14.3	3.7	13.1	3.9	1.5	2.6	3.0
New Hampshire	2.0	–	–	5.4	–	–	1.2	–	2.3	3.1
Connecticut	2.1	–	–	–	1.5	6.0	1.8	–	1.1	2.1
Massachusetts	2.3	18.4	–	12.3	1.1	5.5	1.4	–	1.6	2.1
Rhode Island	2.6	–	–	15.8	–	–	1.4	–	1.6	2.9
New Jersey	3.2	15.7	–	13.2	2.3	7.1	2.6	.9	1.4	2.7
Vermont	3.2	9.4	–	–	2.0	15.0	2.2	–	1.9	2.5
Maryland	3.3	–	–	8.6	4.3	8.9	2.7	.6	1.4	1.2
Maine	3.4	–	–	8.6	3.0	13.2	1.5	–	3.9	3.0
Michigan	3.5	14.4	–	14.4	2.4	9.9	2.7	1.3	2.1	2.1
Arizona	3.8	–	–	8.5	3.1	10.9	2.1	1.3	2.1	3.2
Delaware	3.8	–	–	11.8	3.8	13.0	1.5	–	2.3	3.0
Minnesota	3.8	21.3	–	11.3	1.8	7.0	3.1	1.0	1.6	1.4
Ohio	3.8	24.4	–	13.0	3.0	11.6	1.9	1.1	1.5	2.4
Hawaii	4.0	6.3	–	13.3	–	5.6	2.0	–	3.6	3.2
New York	4.1	24.4	–	13.8	1.9	14.1	4.2	1.1	1.4	2.4
New York City	5.0	–	–	19.9	1.7	13.4	7.5	1.8	2.3	2.5
California	4.3	12.6	–	10.7	2.3	10.9	3.1	1.5	2.7	2.8
Washington	4.3	–	–	11.5	5.2	12.0	2.3	1.1	2.6	1.5
Illinois	4.4	32.4	–	17.6	3.0	10.7	2.3	.8	1.6	2.5
Virginia	4.4	–	–	13.9	3.4	12.6	2.6	.9	1.6	2.0
Wisconsin	4.5	25.9	–	8.8	2.6	10.6	3.0	.7	1.2	3.0
Pennsylvania	4.8	28.7	–	15.1	4.2	12.1	2.3	1.4	2.0	3.0
Iowa	5.2	22.8	–	19.2	2.9	6.4	3.3	1.7	1.1	2.8
Missouri	5.2	26.0	–	13.5	2.7	9.4	3.6	1.9	1.9	3.2
North Carolina	5.3	23.0	–	16.3	3.4	14.0	3.2	1.2	1.7	3.6
Oregon	5.3	10.1	–	16.0	6.4	15.4	2.6	1.8	4.0	3.2
Colorado	5.4	–	–	12.1	2.5	10.7	3.1	1.2	2.9	4.8
Indiana	5.4	–	–	15.4	3.4	14.9	3.5	1.6	2.8	3.8
Florida	5.5	18.3	–	18.0	4.3	11.6	3.9	2.0	3.8	3.1
South Carolina	5.6	14.1	–	17.7	3.4	14.1	4.2	–	2.9	4.4
Texas	5.8	14.6	21.3	17.3	4.3	10.9	3.8	1.1	2.8	3.1
Nevada	6.2	–	–	14.0	8.8	17.0	4.4	2.6	3.1	3.9
Tennessee	6.3	52.8	–	24.3	2.5	11.9	3.8	1.1	2.4	3.3
Utah	6.5	–	–	20.3	4.2	15.1	3.4	–	3.9	4.7
District of Columbia	6.6	–	–	–	–	20.0	13.0	–	2.2	4.3
Georgia	6.6	19.5	–	23.8	5.1	13.2	4.8	2.7	3.6	4.0
New Mexico	7.0	–	–	16.5	5.5	25.7	2.4	–	4.0	3.0
Kansas	7.1	30.6	–	22.5	3.7	14.8	3.4	–	2.2	4.6
Nebraska	7.2	25.7	–	21.7	6.4	20.0	3.5	–	2.1	2.5
Arkansas[7]	7.3	–	–	–	–	–	–	–	–	–
North Dakota	7.3	23.4	–	28.1	–	17.6	1.5	–	1.5	4.3
Oklahoma[7]	7.4	–	–	–	–	–	–	–	–	–
Alabama[7]	7.7	–	–	–	–	–	–	–	–	–
South Dakota	7.8	28.3	–	30.3	3.4	14.1	3.6	–	1.8	4.1
Kentucky	7.9	–	–	18.1	4.3	15.0	2.7	1.3	2.3	3.3
Louisiana	8.3	–	22.6	21.6	10.6	29.3	4.2	1.8	4.1	4.4
Idaho	8.9	29.1	–	14.2	8.0	26.0	4.6	–	3.1	4.9
West Virginia	8.9	–	48.4	31.5	8.5	28.7	2.9	–	2.4	2.7
Mississippi	10.2	33.0	–	23.2	8.4	24.0	6.2	4.5	3.5	4.1
Montana	10.9	35.8	–	25.3	19.4	19.6	3.7	6.7	3.7	5.4
Wyoming	12.5	21.6	27.2	33.9	12.3	30.1	5.7	–	5.8	6.6
Alaska	22.9	–	–	22.2	–	54.6	–	–	38.8	4.5

[1] The State fatal work injury rate per 100,000 workers was calculated as follows:

$$((N92+N93+N94+N95+N96)/(W92+W93+W94+W95+W96)) \times 100,000$$

N = number of civilian worker fatalities, age 16 and older, 1992-96
W = number of employed civilians, age 16 and older, 1992-96
The employed worker figures used in the rate calculations are annual average estimates from the Current Population Survey (CPS), 1992-96.

The relative danger of an industry group can be indicated by combining fatality data with employment data to calculate a rate. An employment-based fatality rate measures the incidence of fatal injury for all workers in a group regardless of exposure time. The rates are experimental measures using CPS employment.

[2] Excludes forestry and fishing. Includes self-employed and family workers.

[3] Individual State rates exclude self-employed and family workers.

[4] Includes forestry and fishing. Individual State rates exclude self-employed, family workers, and private household workers.

[5] Includes workers in governmental organizations regardless of industry. Excludes military personnel.

[6] Includes self-employed, family workers, household workers. Excludes military personnel.

[7] Industry division rates were not calculated because more than 5 percent of the fatality records were unclassified.

NOTE: Dashes indicate that a fatality rate was not calculated because at least one CPS employment estimate was not statistically reliable, or there were fewer than five work injury fatalities, 1992-96. Dashes also indicate footnote 7 for selected States.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries, 1992-96

Chart. Quartile grouping of State fatal work injury rates per 100,000 workers

Quartile		Rate
1		3.8 or below
2		3.9 through 5.4
3		5.5 through 7.3
4		7.4 and above
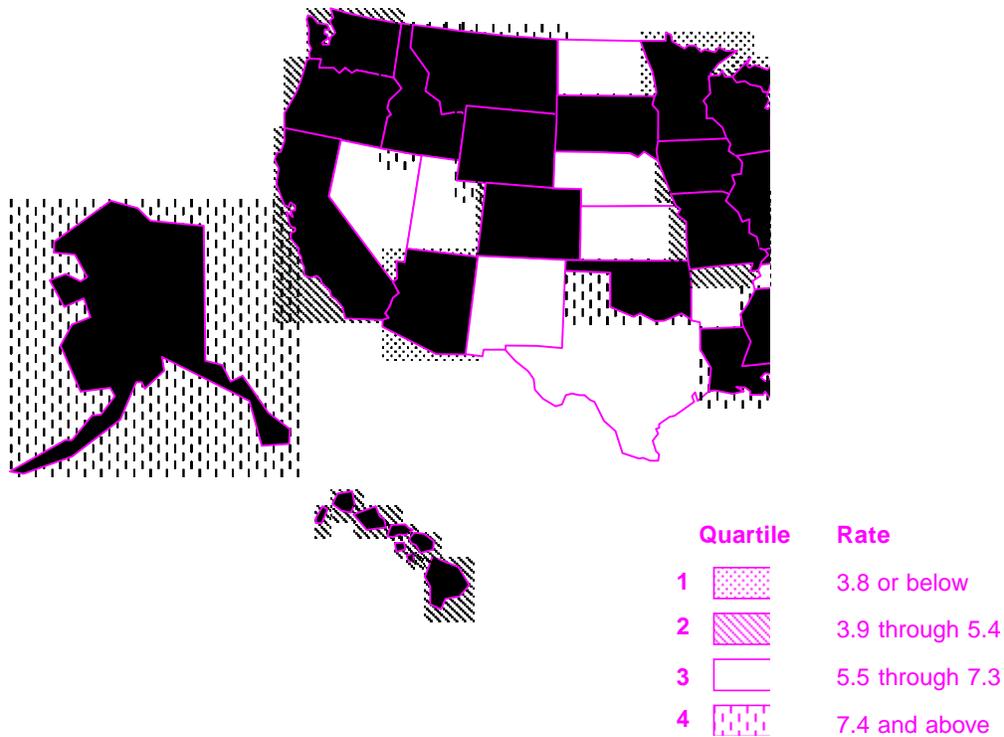
transportation, communications, and public utilities industrial divisions had rates at least double the national average of 5.1. All other divisions were near or below the average. (See table 2.)

Fatality rates by industrial division are helpful in analyzing fatality risk for broad industry groups; however, there can be considerable rate differences among the individual industries within the division. For example, the fatality rate for the manufacturing division was 3.7. But, within the division, the logging industry (SIC 2411) had a fatality rate of 98.7. Among individual industries, commercial fishing and logging had the highest fatality rates.

States in quartile 1 (those with the lowest fatality rates) had larger shares of employment in the lower risk industrial divisions, such as manufacturing; trade; finance, insurance, and real estate; and services. In New England, for example, a relatively high concentration of workers were in finance, insurance, education, and electronics and machinery manufacturing. Both Michigan and Ohio, with the largest number of fatal work injuries in quartile 1, had large concentrations of workers in automobile manufacturing and related industries.

In contrast, most of the States in quartile 4 (those with the highest fatality rates) had larger shares of employment in one or more of the high-hazard industries. Alaska, with the highest fatality rate, had a relatively high concentration of workers in fishing,[5] logging,[6] and air and water trans-portation.[7] Wyoming, with the second highest fatality rate, had one-fourth of its workers in agriculture, mining, construction, and transportation.

A brief discussion of the industries with the highest fatality rates follows.

Mining. Workers in this division had the highest fatality rate, 26.4. Yet, this division accounted for only 3 percent of all fatal work injuries, second only to finance, insurance, and real estate which had the fewest fatalities.

The mining division employs about 600,000 workers, which is about 0.5 percent of the Nation's workers. It is comprised of companies whose primary activity is to extract minerals from the earth. Included in the division are metal mining, coal mining, oil and gas extraction, and mining and

Table 2. Fatal occupational injuries by industry division and selected industries, 1992-96

Industry[1]	Fatalities		Employment[2] (thousands)	Fatality rate[3] (per 100,000 workers)
	Number	Percent		
Total	31,567	100.0	123,732	5.1
Private industry	28,115	89.1	104,004	5.4
Agriculture	3,692	11.7	3,299	21.9
Agricultural production - crops	1,947	6.2	990	38.3
Agricultural production - livestock	867	2.7	1,243	13.4
Agricultural services	782	2.5	1,066	14.6
Mining	843	2.7	639	26.4
Coal mining	223	.7	112	39.7
Oil and gas extraction	434	1.4	353	24.6
Construction	4,973	15.8	6,959	14.3
Manufacturing	3,745	11.9	20,031	3.7
Food and kindred products	400	1.3	1,736	4.6
Lumber and wood products	1,018	3.2	745	27.3
Logging	737	2.3	149	98.7
Transportation and public utilities	4,586	14.5	7,002	13.1
Local and interurban passenger transportation	565	1.8	491	23.0
Trucking and warehousing	2,413	7.6	2,263	21.3
Transportation by air	461	1.5	745	12.4
Electric, gas, and sanitary services	426	1.3	1,110	7.7
Wholesale trade	1,299	4.1	4,793	5.4
Retail trade	3,696	11.7	20,580	3.6
Food stores	1,039	3.3	3,425	6.0
Automotive dealers and service stations	600	1.9	2,065	5.8
Eating and drinking places	909	2.9	6,183	2.9
Finance, insurance, and real estate	592	1.9	7,762	1.5
Services	4,331	13.7	32,939	2.6
Business services	1,037	3.3	4,992	4.2
Automotive repair, services, and parking	511	1.6	1,508	6.8
Forestry and fishing[4]	431	1.4	98	87.8
Forestry	61	.2	36	33.7
Fishing, hunting, and trapping	370	1.2	62	119.4
Government[5]	3,452	10.9	19,728	3.5
Federal	1,135	3.6	4,825	4.7
State	630	2.0	5,034	2.5
Local	1,649	5.2	9,869	3.3

[1] *Standard Industrial Classification Manual, 1987.*
[2] The employment figures are annual average estimates of employed civilians 16 years of age and older, from the Current Population Survey (CPS), 1992-1996. The resident military figure, derived from resident and civilian population data from the Bureau of the Census, was added to the CPS employment total.
[3] The rate represents the number of fatal occupational injuries per 100,000 employed workers and was calculated as follows: (N/W) x 100,000, where N = the number of fatal work injuries, and W = the number of employed workers, as described in the previous footnote. Workers under the age of 16 years were not included in the rate calculations so consistency with the CPS employment figures could be maintained.

[4] Forestry and fishing was included within the service industry to match CPS State employment industry categories.
[5] Includes fatalities to workers employed by governmental organizations regardless of industry.
NOTE: Totals for industry divisions may include industries not shown separately. Percentages may not add to totals because of rounding. During the period 1992-96, there were 376 fatalities (1 percent) with insufficient information to determine a specific industry classification, though a distinction between private and government was made for each.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Census of Fatal Occupational Injuries, 1992-96

quarrying of nonmetallic minerals, such as stone, clay, potash, and borax. The highest fatality rates occurred in Texas, Louisiana, and West Virginia. In Texas and Louisiana, most of the work fatalities occurred in oil and gas extraction; in West Virginia they occurred in coal mining.

Workers in this division are exposed to numerous hazards.[8] In the coal, metal, and nonmetal mining industries, fatal injuries often resulted from roof or other material collapses and falling rocks. They also resulted from working in close quarters with various types of mine machinery, such as roof bolters, shuttle cars, and loaders, and from methane gas explosions. In the oil and gas extraction industries, fatal injuries often resulted from vehicle- and machinery-related incidents as well as from fires and explosions.

Agriculture, excluding forestry and fishing. Workers in this division accounted for 3 percent of employment but incurred about 12 percent of the job-related fatalities. Fatal injuries for these workers occurred at a rate slightly less than for mining, 21.9. Four States accounted for 20 percent of these fatalities: California, Kentucky, Tennessee, and Texas.

This division includes establishments engaged in crop production; the keeping and feeding of livestock; and agricultural services, such as crop dusting, landscaping, and providing horticultural services. Workers in crop production grow items such as wheat and corn, vegetables and melons, and ornamental plants on farms and in orchards, greenhouses, and nurseries. The leading cause of fatal injury to these workers is tractor rollovers. Other fatal injuries occur when workers are struck by falling objects such as bales of hay, or when their clothes get caught in machinery, such as grain augers or power takeoff shafts or other equipment hooked to tractors. For workers in livestock production, like those working on cattle ranches or dairy farms, being gored or kicked by an animal poses an additional hazard.

Construction. Workers in construction had the third highest rate of fatal injury, 14.3, and accounted for the largest number of fatalities. Wyoming, West Virginia, and North and South Dakota had fatality rates that were at least twice the division average; nine other States had rates of 20 or more.

The construction division employs about 7 million workers, which is almost 6 percent of all workers nationwide. It is comprised of three major business groups: General building contractors, heavy construction contractors, and special trade contractors. General building contractors construct homes, apartment buildings, and commercial offices as well as industrial and public buildings, such as schools, arenas, and government offices. Heavy construction contractors build and repair highways, bridges, tunnels, and pipelines. Special trade contractors, who account for a little over half of construction fatalities, perform electrical, plumbing, roofing, siding, sheet metal, and other specialty work.

The following tabulation shows the distribution of fatalities in construction for 1992-96.

Construction	Fatalities	
	Number	Percent
Division	4,973	100
General building contractors	880	18
Heavy construction, except building	1,235	25
Highway and street construction ..	421	9
Heavy construction, except highway	789	16
Bridge, tunnel, and elevated highway	118	2
Water, sewer, and utility lines	372	8
Special trade contractors	2,833	57
Plumbing, heating, air-conditioning	297	6
Electrical work	384	8
Masonry, stonework, and plastering	245	5
Roofing, siding, and sheet metal work ...	449	9
Miscellaneous special trade contractors	873	18
Structural steel erection	232	5

Falls were the leading cause of death in this division, accounting for nearly 30 percent of the construction fatalities. Primarily, these falls were from roofs, scaffolds, and ladders. Other construction hazards include highway crashes, falling objects (such as materials being lifted by cranes), overhead powerlines, passing vehicles, and construction vehicles backing up.

Transportation, communications, and public utilities. Workers in this division had the fourth highest rate of fatal injury, 13.1. They accounted for about 6 percent of the Nation's total workforce and 13 percent of job-related fatalities. In general, States with long stretches of highways and rough terrain or with large air or water transportation industries had the highest fatality rates for this major division. States with fatality rates of 25 or more included Alaska, Wyoming, Louisiana, West Virginia, Idaho, and New Mexico.

Industries in this division transport passengers, mail, and freight by road, rail, air, and water and provide communications and utility services. Most often, workers in the transportation industries were fatally injured in incidents that related to their particular mode of transport (highway vehicle crashes and overturnings, capsizing water vessels, aircraft crashes). Other hazards included geographical and meteorological features, such as mountainous terrain and severe weather conditions. Fatalities in communications and public utilities resulted from contact with overhead powerlines or other electrically-charged equipment, bucket-lift failures while repairing utility lines, and being struck by vehicles while collecting refuse.

Logging. Nationally, workers in the logging industry had a fatality rate of 98.7. Most of the States in which this industry is prominent—Alabama, Louisiana, Idaho, Mississippi, Montana, and Alaska—had overall fatality rates well above the national rate of 5.1.

Most of the workers who were fatally injured were struck by falling trees or branches or by rolling logs. But each year, several workers were killed in vehicle-related incidents, such as crashes on public roadways or logging roads, or after being struck by logging equipment, such as loaders, skidders, or bulldozers.

Commercial fishing. With a fatality rate of 119.4, commercial fishing is considered the most dangerous industry. Alaska accounted for one-third of all fatal work injuries in commercial fishing.

Most fishing fatalities resulted from capsized water vessels or from falls from boats. Falls from boats were particularly hazardous in colder areas, where hypothermia affects even good swimmers. A growing number of fatalities occurred from fishers drowning while diving for sea cucumbers or while untangling nets or lines that had been snagged in the boat's propellers. Unstable boats, slippery decks cluttered with fishing equipment, and winter harvests posed additional hazards for fishers. These hazards were further magnified in recent years because depleted fish stocks forced fishing vessels to travel further offshore into rougher, more dangerous waters.

Other factors influencing fatality rates

State employment counts and the industry mix of a State explain only part of the variation in State fatality rates. Many of the quartile 1 and 2 States (those with the lowest fatality rates) did have workers in one or more of the high-hazard industries. For example, Washington, Oregon, and many of the New England States are noted for their logging and fishing industries. Another explanation for this variance may be that the employment data used in the rate calculation is based on the workers' State of residence.[9] When computing national rates, it does not matter whether the fatally injured worker lived in the State where the injury occurred. However,

it does matter when calculating State rates, especially if a large number of workers were out of State residents. For example, it has been estimated that about one-third of the workers in the Alaskan commercial fishing industry are residents of other States.[10] This may result in an overstated fatality rate for Alaska because one-third of the industry's workers who were at risk of being fatally injured were excluded from the denominator of the State's fatality rate because they were not residents of Alaska. This explanation may also be relevant for Wyoming's high fatality rate in the transportation industry. A large number of nonresident, interstate truck drivers travel Wyoming's highways and contribute to the State's fatality numbers; but, because they are nonresidents, they are not included in the denominator for calculating the State's fatality rate.

Geography and weather conditions can contribute to differences in State fatality rates. For example, a fisher falling off a boat in Florida may have a better chance of survival than one who falls into the icy Alaskan waters. Severe weather conditions and mountainous terrain also contribute to fatalities resulting from aircraft and highway crashes, falls, and being struck by wind blown objects.

Another factor that may affect a State fatality rate is the availability of emergency medical services. Most States with high fatality rates are primarily rural. Some of the workers fatally injured in rural areas might have survived if emergency medical services had been more readily available. In some areas, transportation to trauma centers by medivac helicopter units with trained medical personnel is not available.

The composition of the workforce may also affect fatality rates among the States. Workers aged 65 and over and workers who are self-employed are at increased risk of dying from job related injuries.[11] Therefore, States with large numbers of older or self-employed workers may have higher fatality rates.

The safety and health climate of the State can help reduce the risk of fatal work injuries. The issuance and enforcement of workplace safety standards along with worker training can affect this climate. States have devoted various resources to assist in this effort. Some States have occupational safety and health plans that have been approved by the U.S. Occupational Safety and Health Administration; others have divisions within the State Health Department that are devoted specifically to occupational issues; and some have universities that are actively researching ways to improve occupational safety. State laws and other actions not specifically targeted to address worker fatalities can also affect worker safety. Measures, such as stricter enforcement of speed limits and seat belt laws, taken to prevent highway fatalities may also assist in preventing worker fatalities—20 percent of which result from highway traffic incidents.

Summary

State fatality rates are one way to compare fatality risk, but analysis of frequency counts is important. Both Ohio and Michigan were in the lowest State fatality rate quartile; each had only one industry division with a fatality rate above the national average. Yet they would have been in the highest quartile if States had been arranged in quartiles by number of fatal work injuries. Almost 1,800 workers lost their lives in the two States during 1992-96.

Comparisons among States are problematic because many factors influence occupational fatality counts and rates. Each State has to evaluate its circumstances, keeping in mind its unique industry mix, geographical features, and the composition of its workforce. States can use this information along with fatality census data to monitor occupational injury deaths, target workplace hazards, conduct State-based research, develop appropriate safety standards, and disseminate educational materials to its workers.

Technical note

Fatality data. Data on fatal work injuries are from the Bureau of Labor Statistics' Census of Fatal Occupational Injuries (CFOI), 1992-96. This program, which has collected occupational fatality data nationwide since 1992, uses diverse data sources to identify, verify, and profile fatal work injuries. Information about each workplace fatality (occupation and other worker characteristics, industry of employer, and equipment involved and other circumstances of the event) is obtained by cross-referencing source documents, such as death certificates, workers' compensation records, news accounts, and reports to Federal and State agencies. This method assures counts are as complete and accurate as possible.

The industry and occupation reported in the fatality data refer to the job held by the worker when the fatal injury occurred. Fatalities are counted according to the State where the fatal injury occurred.

Experimental fatality rates. Fatality rates are used to compare the risk of incurring a fatal work injury among worker groups with varying employment or exposure levels. There is more than one method to calculate a fatality rate. An hours-based rate measures the risk of fatality per standardized length of exposure; an employment-based rate measures the risk for those employed during a given period of time, regardless of exposure hours. Hours-based measurements are especially useful for comparing worker groups with varying exposure hours, such as when a large proportion of workers in an industry work part-time.

Fatal work injury rates included in this article are employment based and are considered experimental measures. They provide the number of fatal work injuries per 100,000 workers for 1992-

96 and were calculated as follows:

$$[(N_{92} + N_{93} + N_{94} + N_{95} + N_{96}) / (W_{92} + W_{93} + W_{94} + W_{95} + W_{96})] \times 100,000;$$ where

N = number of civilian worker fatalities, age 16 and older, 1992-96, and

W = annual average number of employed civilians, age 16 and older, 1992-96.

Because the CFOI program does not collect employment or hours of exposure data, annual average estimates from the Current Population Survey (CPS) for 1992-96 are used in the denominator "W." The rates do not reflect the movement of persons in and out of the labor force, the length of their work week or work year, or the effect of multiple jobholders.

The CPS reports workers' occupation and industry according to their primary job, which may differ from the job held when fatally injured. Because the CPS is a survey of households, workers are counted in their State of residence, which may differ from the State in which the fatal injury occurred. Although this is not important when considering national data, it may have a significant impact in States with a large proportion of workers residing in another State.

National industry rates included in this article may differ from those appearing in other reports because they were adjusted to be consistent with State fatality rates. For example, nationally, forestry and fishing are usually included in the agriculture division, but are included in the services division in this article. State rates are calculated in this manner to be consistent with the CPS State employment data.

A State fatality rate was not calculated for an industry division if one of the following conditions existed:

- More than 5 percent of the State's

1992-96 fatalities were classified as "industry unknown";

- There were fewer than five work injury fatalities in the industry in that State during 1992-96; or

- The CPS State industry employment estimate was not statistically reliable for one or more of the 5 years.

Agriculture and mining employment data were not available for all years for some States. This may affect State industry rankings by fatality rate.

The CPS employment data used to calculate rates are estimates based upon a sample of persons employed rather than a complete count. Therefore, the employment estimates and fatality rates have sampling errors; that is, they may differ from figures that would have been obtained if it had been possible to take a complete census of employed persons. See "Explanatory Notes and Estimates of Error" in the January 1996 *Employment and Earnings* for an explanation of CPS sampling and estimation methodology, and standard error computations. The relative standard errors of the CPS employment estimates can be used to approximate confidence ranges for the fatality rates.

Additional information. For more information on the Census of Fatal Occupational Injuries (CFOI) program, access the BLS Internet site at **http://stats.bls.gov/oshfat1.htm** or E-mail **cfoistaff@bls.gov** with your request. Additional State fatality data may be available from the individual State agencies participating in the CFOI program. A list of these agencies and their phone numbers is included in the 1996 News Release, USDL: 97-266, which is available on the BLS Internet site.

[1] "National Census of Fatal Occupational Injuries, 1996," USDL: 97-266, August 7, 1997.

[2] State fatality rates represent the number of fatal occupational injuries per 100,000 employed workers for the period 1992-96.

[3] The number of States in each group or quartile varied slightly to keep States with identical fatality rates in the same group.

[4] Industry is classified according to the *Standard Industrial Classification Manual*, 1987.

[5] The fishing industry is usually reported in the agriculture, forestry, and fishing division in analyses of national fatality data. However, it is being included in the services division for this article to be consistent with its treatment in the employment data used to calculate State fatality rates.

[6] For a discussion of the logging industry, see Elizabeth Dietz, "Wages in Forestry and Logging," *Compensation and Working Conditions*, Spring, 1997, pp. 51-53.

[7] For additional information on hazards encountered by loggers, fishers, and aircraft pilots, see Mick Hans, "Will Safety Improve in the Three Most Perilous Professions?" *Safety + Health*, August 1995, pp. 52-57.

[8] See David McDermott, "Workplace Injuries and Illnesses in the Extractive Industries," *Compensation and Working Conditions*, Winter 1997, pp. 57-61, for a discussion of mining's risk of nonfatal injuries and illnesses.

[9] See the discussion of fatality rates in the Technical note included in this article.

[10] See Richard D. Kennedy and Jennifer M. Lincoln, "Epidemiology of Fatal Injury in the U.S. Commercial Fishing Industry," *Safety and Health in Agriculture, Forestry, and Fisheries*, Government Institutes, Inc., Rockville, MD (1997), pp. 557-570.

[11] See John Ruser, "Denominator Choice in the Calculation of Workplace Fatality Rates," *American Journal of Industrial Medicine*, February 1998, pp. 151-156, and Martin E. Personick and Janice A. Windau, "Self-employed Individuals Fatally Injured at Work," *Monthly Labor Review*, August 1995, pp. 24-30.