Profile of Fatal Work Injuries in 1996

Thousands of workers die each year from on-the-job-injuries. Although no one is immune from fatal work injuries, some workers are more at risk than others because of the work they perform or their work environment.

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Transportation-related activities result in a large number of worker fatalities. In fact, two-fifths of on-the-job deaths result from vehicle-related incidents, such as trucks jackknifing, farm tractors overturning, workers being struck by vehicles, and watercraft capsizing. Other worker fatalities result from assaults during robberies; falls from roofs and scaffolding; electrocutions from contacting power lines; and being struck by falling objects. This article describes the types of events[1] that resulted in fatal injuries to workers and profiles the most dangerous jobs in 1996.[2] Employers, workers, and safety and health professionals can use this information to design and implement safety programs for injury prevention.

Circumstances of fatal injuries

The number of fatal work injuries fell in 1996 to the lowest level in 5 years. Highway traffic incidents and homicides continued to lead all other events in the number of fatal work injuries in 1996, contributing to over one-third of the total that occurred during the year. (See table 1.) Work-related highway deaths accounted for one-fifth of fatal work injuries in 1996. Truckdrivers continue to make up about two-fifths of the job-related highway fatality victims; their number of highway fatalities remained virtually unchanged between 1994 and 1996. Overall, slightly more than half of all job-related highway fatality victims were driving or riding in a truck. The following tabulation shows the most common vehicles occupied by job-related highway fatality victims in 1996:

Vehicle	*Number of highway fatalities*	*Percent*
Total	1,324	100
Truck	746	56
Semitrailer truck	352	27
Pickup truck	144	11
Delivery truck	37	3
Dump truck	31	2
Automobile	345	26
Van	73	6
Tractor	25	2
Other or not reported	135	10

Because their jobs involve traveling to and from worksites, patients' homes, and meetings with clients, health care and social service workers, protective service workers, sales representatives, and driver-sales workers also incur relatively large numbers of job-related highway fatalities.

Off-road vehicle-related incidents, such as a tractor overturning in the field or a forklift overturning in a warehouse, pose additional hazards, particularly among farmers and industrial machine operators. These types of incidents accounted for about 6 percent of all fatal work injuries in 1996.

Each year, about the same number of workers are fatally struck by a vehicle. Persons who work near roadways, in parking lots, or near tractors

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are at particular risk. In 1996, such workers included truckdrivers unloading goods from their trucks, farmers working in fields, police officers directing traffic or writing tickets, and laborers working on construction sites and performing various other duties.

Air, rail, and water transport together accounted for another 8 percent of the fatal work injuries. Victims of these types of fatal events included aircraft pilots and attendants, crop dusters, business travelers, railroad employees, fishers, and workers in the water transportation industry.

Homicide was the second leading cause of job-related deaths and accounted for 15 percent of fatal work injuries during 1996. Mirroring a general trend in homicide risk throughout the United States, job-related homicides fell 12 percent below the 1995 total and 16 percent below 1994, when job-related homicides recorded a 5-year high. While most industry divisions had declines in the number of job-related homicides, retail trade and services had slight increases over 1995, consistent with their increase in employment. Although the number of job-related homicides for taxicab drivers declined substantially from the previous year, this occupational group still had the highest rate of homicides during 1996. (See chart 1.)

Robbery was the primary motive of job-related homicides. Almost half of the homicide victims worked in retail establishments where cash is readily available, such as grocery stores and eating and drinking establishments. Disputes among coworkers and with customers and clients accounted for about one-seventh of the job-related homicide total. Many of these homicides were committed after a worker was fired or a customer or tenant was asked to leave the premises. Arguments with customers and clients ranged from disagreements over monetary issues, such as rental or legal fees owed and quality of goods or services received, to disputes over refusal to be served alcohol. One-sixth of the workplace homicides for female workers resulted from domestic disputes. The following tabulation lists the relationship of alleged perpetrators to the homicide victim:

Circumstances or alleged perpetrator	*Number of job-related homicides*	*Percent*
Total	912	100
Robberies and other crimes	726	80
Work associates	129	14
Coworker, former coworker	75	8
Customer, client	54	6
Relatives	31	3
Husband, ex-husband	20	2
Other relative	11	1
Other personal acquaintances	26	3
Boyfriend, ex-boyfriend	11	1
Other acquaintance	15	2

Worker deaths resulting from falls continued to rise in 1996, accounting for 11 percent of fatal work injuries. Construction trade workers, such as carpenters, roofers, structural metal workers, and painters, accounted for about one-third of fatal fall victims; construction laborers had about one-tenth of the total. Overall, about one-half of job-related fatal falls occurred in the construction industry, where deaths due to falls have risen by about one-fourth over the last 5 years. Part of the increase can be explained by the rise in construction activity over the past few years.

One-fifth of falls were from, or through, roofs; falls from scaffolding and from ladders also resulted in large numbers of deaths. While still relatively small in number, falls from nonmoving vehicles rose by almost two-thirds over the previous year. Increases in falls for truckdrivers and construction trade workers were partly responsible for this rise.

Various objects, such as falling trees, building materials, and machinery or vehicles that slipped into gear, struck nine percent of the fatally injured workers. Fatalities resulting from being struck by falling objects were at their highest level since the fatality census began in 1992. Partly responsible for the higher level in 1996 was an increase in the number of workers killed by falling trees, branches, and logs. Besides timber cutting and logging occupations, falling trees and logs are hazardous to truckdrivers in the lodging industry, heavy equipment operators, construction laborers, farmers, and grounds-keepers.

Job-related electrocutions in 1996 declined 20 percent from their 1995 total to below 300 for the first time since 1992. A reduction in the number of electrocutions among construction trade workers, such as painters, electricians, and carpenters, accounted for a large portion of the decline from the 1995 total. About two-fifths of worker deaths from electrocution resulted from the worker or equipment being used coming into contact with overhead power lines. Besides construction workers installing or repairing electrical lines, other workers coming in contact with overhead lines include truckdrivers and heavy equipment operators raising truck booms or truck beds, and farmers and grounds-keepers trimming trees.

Fatality risk by industry

By comparing percent distributions of fatalities and employment, the risk of a job-related fatality for a given occupation, industry, or worker characteristic can be evaluated. For example, the construction industry accounted for about 17 percent of the fatality total, about 3 times its 6-percent share of total employment. Besides employment, other measures, such as employee exposure hours, can be used to evaluate the risk of fatal work injuries for a worker group.

The fatality rate in table 2 relates the total number of job-related deaths in 1996 to the annual average number of workers facing that risk in each industry. Fatality rates can be used to compare the risk of incurring a fatal work injury among industries with varying employment or exposure levels.[3] The industry fatality rate is calculated by dividing the number of fatalities for an industry during a given time period by the average number of workers in that industry during that

time period. Thus, the fatality rate depicts the risk of incurring a fatal work injury within the industry and is expressed as the number of fatalities per standard measure—for example, per 100,000 workers. In 1996, the fatality rate for workers in the construction industry was 13.9 deaths per 100,000 workers. Although the construction industry had more fatalities than any other industry, workers in the mining industry had the highest risk of incurring a fatal work injury, at 26.8 deaths per 100,000 workers.

Industries employ workers in diverse occupations. For example, the construction industry employs engineers, secretaries, truckdrivers, crane operators, vehicle mechanics, real estate agents, and accounting clerks, in addition to carpenters and electricians. Because work activities performed by workers in these occupations differ so widely, hazards they face will also vary. It is, therefore, beneficial to consider fatality risk by occupation, as work activities and associated hazards are more homogenous. For example, a truckdriver for a construction firm faces similar hazards on the highways as a truckdriver employed by a manufacturing firm.

Fatality risk by occupation

Fatality counts are important in evaluating hazardous jobs because the number of workers killed indicates the magnitude of a safety problem for a group of workers. Table 3 lists the 50 occupations with the highest number of fatalities. Combined, these occupations accounted for 74 percent of the job-related fatalities in 1996. Truckdrivers, farm occupations, sales occupations, and construction laborers top the list; these four occupations alone accounted for 35 percent of all job-related fatalities in 1996.

If occupations with the highest fatality risk are considered, then fishers, timber cutters, aircraft pilots, and structural metal workers are the four most dangerous jobs; they had the highest fatality rates where data were available to calculate the rates. But, in comparison to the four occupations with the largest number of fatalities, these four high-risk occupations accounted for only 5 percent of the job-related fatalities. (Charts 2 and 3 compare occupations having the largest number of fatal work injuries and those with the highest fatality risk.) And, if occupations with fewer than 20 fatalities had been included on the list, relatively more dangerous occupations could have been identified. For example, if three painter apprentices are killed at work during a year, the relative risk for that occupation group would be 70 times greater than for the average worker.[4] Another method of comparing risk among worker groups is to compare the risk of a fatal work injury for a particular group of workers to that of all workers. An index of relative risk is expressed as the ratio of the fatality rate for that group to the rate for all workers. For example, table 3 shows the relative risk for taxicab drivers at 6.7 meaning that taxi drivers are almost 7 times as likely to have a fatal work injury as the average worker.[5]

Truckdrivers. Truckdrivers accounted for slightly more than 2 percent of the employed workers in 1996 but incurred 13 percent of all job-related fatal injuries. Truckdrivers are a major link between producers of goods and consumers. They pick up raw materials from farmers and other suppliers and deliver them to manufacturing plants. Additionally, they deliver finished products across towns and States to retailers and individual consumers. However, working conditions for truckers are often stressful and physically demanding. Truckers, particularly those who travel short distances, often load and unload their own trucks, requiring considerable lifting and carrying of heavy loads. Long distance truckers often drive for many hours at a stretch through bad weather, heavy traffic, or difficult terrain. Truckers involved in interstate commerce may not return home for days or sometimes, weeks. These long distance drivers face boredom, loneliness, and fatigue. As a result, a trucker's work and lifestyle can be contributing factors to the high number of fatalities and the high risk of fatal injuries on the highways.

Highway crashes, jackknifing, and rollovers together account for about two-thirds of truckdriver deaths, as shown in the tabulation below. Some truckers are struck by other vehicles while inspecting their loads or are crushed by falling materials from trucks. In addition, truckdrivers may become prey to highjackers or even killed for their cargo.

Event and exposure	*Number of truckdriver fatalities*	*Percent*
Total	785	100
Transportation incidents	616	78
Highway	514	65
Collision between vehicles, mobile equipment	181	23
Vehicle struck stationary object on side of road	118	15
Noncollision incident	173	22
Jack-knifed or overturned	138	18
Nonhighway	19	2
Worker struck by vehicle	55	7
Collision with rail vehicle	21	3
Contact with objects and equipment	69	9
Falls	34	4
Exposure to harmful substances	25	3
Assaults and violent acts	34	4

Farm occupations. Workers in farm occupations accounted for slightly less than 2 percent of those employed but incurred 9 percent of job-related fatalities in 1996. Because of the nature of farm work, farmers must often be a jack-of-all-trades. It is not uncommon for a farmer to do mechanical repairs on farm equipment; perform electrical inspections on heating systems used for tending animals; work with chemicals, mixing various ingredients to control crop disease and pest infestation; or design and maintain an irrigation system to keep crops growing. Because of the multitude of tasks on a farm, workers are killed under a variety of circumstances.

Slightly more than one-third of the deaths in farm occupations occurred in tractor-related incidents that included workers falling from tractors and hitting the ground, being struck by equipment pulled by tractors, getting caught in the power take-off or other moving parts, and being struck by tractors that have overturned or slipped into gear. Other farm workers are killed on highways, while delivering produce to market, picking up supplies, or just getting to their fields to work. Some are electrocuted by overhead powerlines or while using electrical equipment to do farm chores. Others are killed while tending cattle and horses, or from heatstroke, freezing weather, and lightning. The following tabulation shows the most common events and exposures resulting in fatalities to farm workers:

Event and exposure	*Number of farm occupation fatalities*	*Percent*
Total	569	100
Transportation incidents	260	46
Highway vehicle incidents	58	10
Nonhighway vehicle incidents	172	30
Overturned vehicles	112	20
Fell and struck by vehicle	32	6
Worker struck by vehicle	22	4
Contact with objects and equipment	151	27
Struck by objects	71	12
Caught in or compressed by machinery	64	11
Falls	42	7
Exposure to harmful substances	45	8
Electrocutions	21	4
Animal assaults	27	5

Sales occupations.[6] Sales occupations accounted for 12 percent of those employed in 1996, but they incurred about 8 percent of all fatal work injuries, indicating that their chance of fatal injury was less than the average worker.

Sales workers are employed in a wide variety of industries, including manufacturing, real estate, wholesale and retail trade, as well as in such service industries as hotels, amusement parks, and movie theaters and video rentals. Besides assisting customers with their selection of items, they often receive payment for purchases. Some, particularly sales supervisors and proprietors, are responsible for picking up change at banks or depositing cash or other receipts. Largely as a result of this proximity to cash, slightly over half of their job-related deaths result from homicide, primarily as a consequence of robberies.

Some sales work involves being on the road, traveling to and from sales meetings, picking up supplies, or delivering products to customers. Consequently, about one-fifth of sales worker fatalities resulted from highway crashes, as shown in the following tabulation:

Event and exposure	*Number of sales occupation fatalities*	*Percent*
Total	503	100
Transportation incidents	141	28
Highway	113	22
Contact with objects and equipment	13	3
Falls	17	3
Exposure to harmful substances	11	2
Assaults and violent acts	316	63
Homicides	295	59
Shooting	241	48
Stabbing	27	5
Other	27	5

Construction laborers. Construction laborers accounted for less than 1 percent of those employed but incurred about 5 percent of all job-related fatalities. These laborers figuratively are the "backbone" of the construction industry. They mix mortar and haul bricks and blocks for masons; build scaffolding used by artisans to erect buildings; and move materials at work sites using various types of vehicles. By virtue of their diverse job tasks, construction laborers face numerous hazards on a worksite. Some fall from roofs, scaffolding, or ladders; come in contact with electric current; are struck or crushed by falling building materials; are engulfed in trench cave-ins; and are struck by forklifts or other vehicles. The following tabulation shows the most common events and exposures that resulted in job-related fatalities for construction laborers:

Event and exposure	*Number of construction laborer fatalities*	*Percent*
Total	291	100
Transportation incidents	89	31
Highway	27	9
Nonhighway vehicle incidents	8	3
Worker struck by vehicle, mobile equipment	49	17
Contact with objects and equipment	86	30
Struck by objects	40	14
Caught in or crushed in collapsing materials	38	13
Excavation or trenching cave-in	28	10
Falls	65	22
Fall from roof	30	10
Exposure to harmful substances	39	13
Electrocutions	26	9

In conclusion, what do occupations with the largest number of fatalities have in common with those occupations at highest risk of a fatal injury? In general, both of these groups of workers primarily perform work activities in the outdoors and in other environments that are more difficult to control than, for example, in a manufacturing plant. Additionally, transporting materials using trucks, tractors, and forklifts is a widespread activity that often results in mishaps between the worker and vehicle. Other major incidents resulting in job-related fatalities involve falls from elevations, electrocutions from overhead powerlines, and being struck by objects.

Information on dangerous jobs and their most frequent fatal events discussed in this article can be used by employers and safety professionals to target efforts to reduce fatal work injuries. Employee awareness of these hazards, however, is key to workplace safety.

—ENDNOTES—

[1] The event or exposure describes the manner in which the injury was produced or inflicted by the source of the injury.

[2] Data on fatal work injuries are from the Bureau of Labor Statistics' Census of Fatal Occupational Injuries (CFOI), 1996. 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, equipment being used, and 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. For more information on the CFOI program, access the BLS Internet site at **http://stats.bls.gov/oshfat1.htm** or E-mail **cfoistaff@bls.gov** with your request.

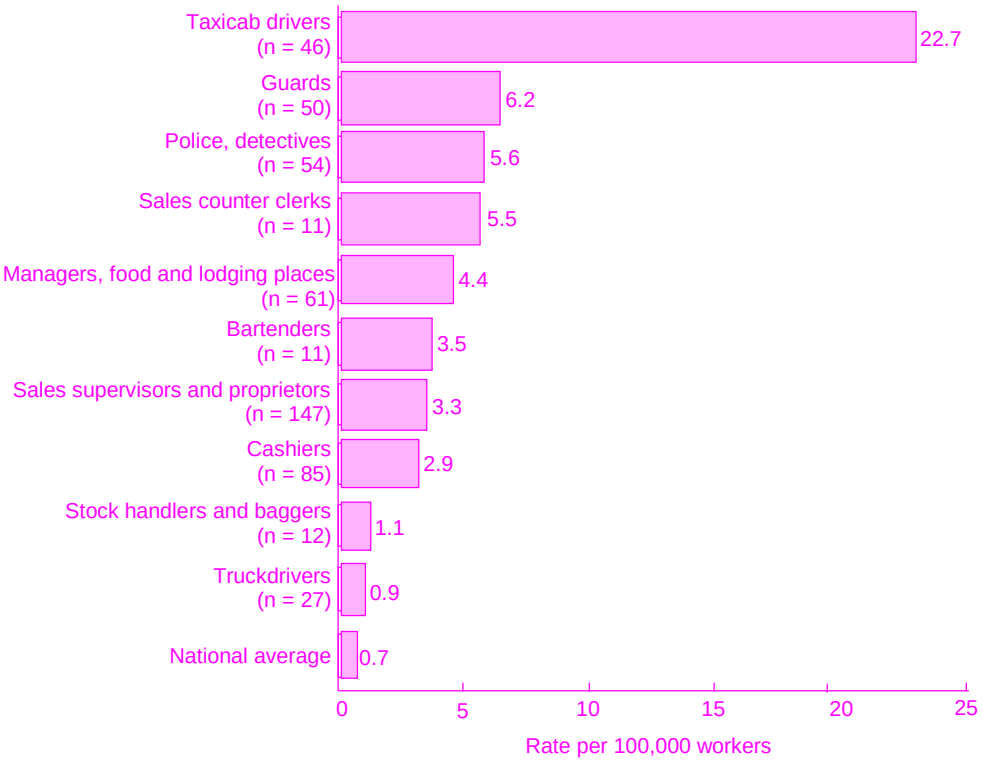
[3] There is more than one method to calculate fatality rates that measure the incidence of fatal work injuries for groups of workers. An hours-based rate measures the risk of fatality per standardized length of exposure; an employment-based rate measures the risk for those employed during a given period of time.

[4] Paul J. Leigh, "*Causes of Death in the Workplace,*" Westport, CT: Quorum Books, 1995, p. 44.

[5] For additional information on relative risk of both fatal and nonfatal injuries, see "*Report on the American Workforce,*" U.S. Department of Labor, 1994, pp. 95-138; and Guy A. Toscano, "Dangerous Jobs," *Compensation and Working Conditions*, Summer 1997, pp. 57-60.

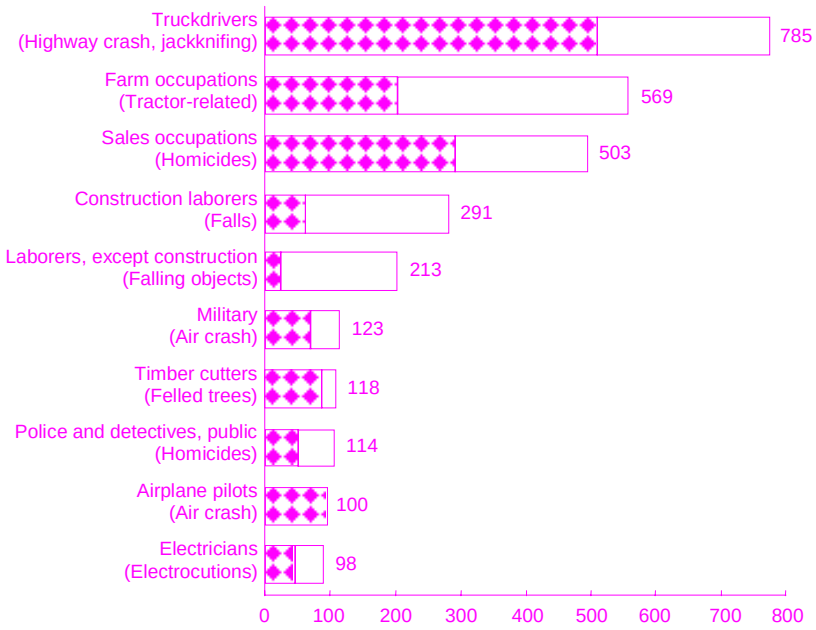
[6] Sales occupations include sales supervisors and proprietors, cashiers, retail and wholesale workers, and various sales representatives.

Chart 1. Occupations at "high-risk" of homicide, 1996



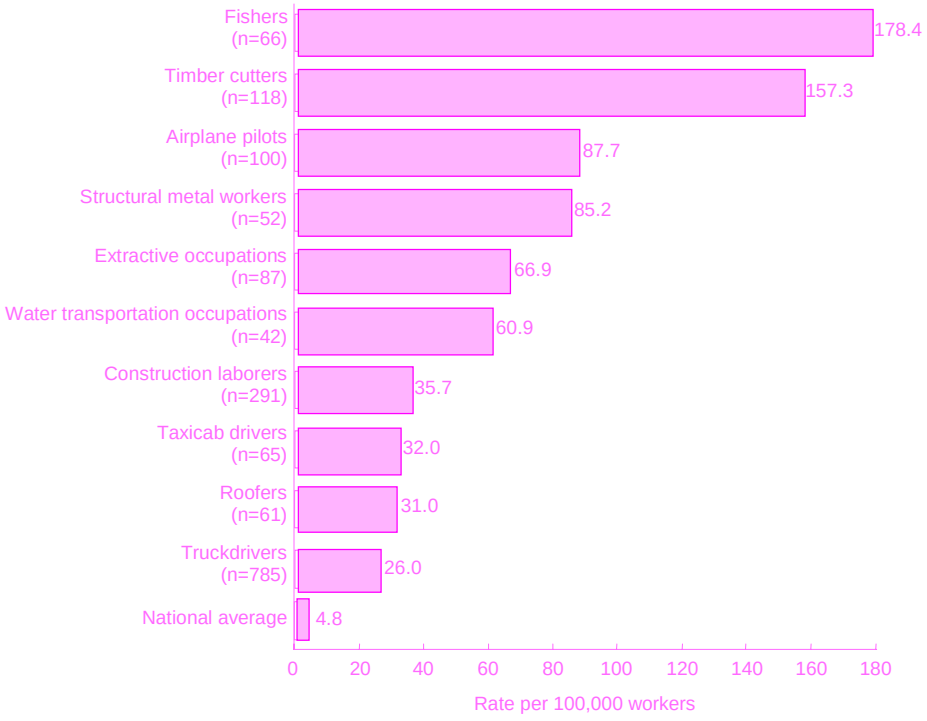
NOTE: The employment-based rates shown were calculated as follows:
(N/W) x 100,000 where
N = the number of workers in a particular group who were victims of homicide and,
W = the annual average number of workers employed in that group.
Employment data are from the 1996 Current Population Survey.

Chart 2. Occupations with large numbers of worker fatalities and the leading event, 1996



NOTE: Leading fatal event for each occupation is shown in parentheses and in the checkered portion of the bar.

Chart 3. Occupations at "high-risk" of a fatal work injury, 1996



NOTE: The employment-based rates shown were calculated as follows:
(N/W) x 100,000, where
N = the number of fatally injured workers in a particular group (for example, roofers) and,
W = the annual average number of workers employed in that group.
Employment data are from the 1996 Current Population Survey.

Table 1. Fatal occupational injuries by event or exposure, 1992-96

Event or exposure[1]	Fatalities					
	1992	1993	1994	1995	1996	
	Number	Number	Number	Number	Number	Percent
Total	6,217	6,331	6,632	6,275	6,112	100
Transportation incidents	2,484	2,499	2,762	2,587	2,556	42
Highway	1,158	1,242	1,343	1,346	1,324	22
Collision between vehicles, mobile equipment	578	659	654	642	656	11
Moving in same direction	78	100	120	127	95	2
Moving in opposite directions, oncoming	201	245	230	246	214	4
Moving in intersection	107	123	144	99	153	3
Vehicle struck stationary object or equipment	192	189	255	275	240	4
Noncollision	301	336	373	352	348	6
Jack-knifed or overturned--no collision	213	236	274	261	264	4
Nonhighway (farm, industrial premises)	436	392	409	387	369	6
Overturned	208	214	226	209	204	3
Aircraft	353	282	426	283	320	5
Worker struck by a vehicle	346	365	391	388	349	6
Water vehicle	109	119	94	87	107	2
Railway	66	86	81	82	75	1
Assaults and violent acts	1,281	1,329	1,321	1,280	1,144	19
Homicides	1,044	1,074	1,080	1,036	912	15
Shooting	852	884	934	762	751	12
Stabbing	90	95	60	67	79	1
Other, including bombing	102	95	85	206	82	1
Self-inflicted injury	205	222	214	221	199	3
Contact with objects and equipment	1,004	1,045	1,017	916	1,005	16
Struck by object	557	565	590	547	579	9
Struck by falling object	361	346	372	341	402	7
Struck by flying object	77	81	68	63	58	1
Caught in or compressed by equipment or objects	316	311	280	255	283	5
Caught in running equipment or machinery	159	151	147	131	146	2
Caught in or crushed in collapsing materials	110	138	132	99	130	2
Falls	600	618	665	651	684	11
Fall to lower level	507	534	580	578	607	10
Fall from ladder	78	76	86	97	95	2
Fall from roof	108	120	129	143	148	2
Fall from scaffold, staging	66	71	89	82	88	1
Fall on same level	62	49	63	53	49	1
Exposure to harmful substances or environments	605	592	641	609	523	9
Contact with electric current	334	325	348	348	279	5
Contact with overhead power lines	140	115	132	139	116	2
Contact with temperature extremes	33	38	50	56	32	1
Exposure to caustic, noxious, or allergenic substances	127	116	133	107	119	2
Inhalation of substance	83	68	84	62	75	1
Oxygen deficiency	111	112	109	97	92	2
Drowning, submersion	78	90	89	77	67	1
Fires and explosions	167	204	202	207	184	3
Other events or exposures[2]	76	44	24	25	16	([3])

[1] Based on the 1992 BLS Occupational Injury and Illness Classification Structures.
[2] Includes the category "Bodily reaction and exertion."
[3] Less than 0.5 percent.

NOTE: Totals for major categories may include subcategories not shown separately. Percentages may not add to totals because of rounding.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, Census of Fatal Occupational Injuries, 1996.

Table 2. Number, percent, and rate of fatal occupational injuries by industry, 1996

Industry[1]	Fatalities		Employment (thousands)[2]	Fatalities per 100,000 workers[3]	Relative standard error[4] (percent)
	Number	Percent			
Total	6,112	100	127,997	4.8	0.2
Private industry	5,521	90	108,472	5.1	.2
Agriculture, forestry and fishing	798	13	3,505	22.2	1.9
Agricultural production - crops	335	5	1,025	31.3	3.5
Agricultural production - livestock	154	3	1,214	12.2	3.2
Agricultural services	171	3	1,189	14.3	3.2
Mining	152	2	567	26.8	4.7
Coal mining	39	1	98	39.8	11.3
Oil and gas extraction	82	1	302	27.2	6.5
Construction	1,039	17	7,464	13.9	1.3
Manufacturing	715	12	20,434	3.5	.7
Food and kindred products	70	1	1,706	4.1	2.7
Lumber and wood products	203	3	794	25.6	4.0
Transportation and public utilities	947	15	7,248	13.1	1.3
Local and interurban passenger transportation	78	1	503	15.5	5.0
Trucking and warehousing	511	8	2,451	20.8	2.3
Transportation by air	113	2	778	14.5	4.0
Electric, gas, and sanitary services	88	1	1,066	8.3	3.4
Wholesale trade	267	4	4,942	5.4	1.6
Retail trade	672	11	21,443	3.1	.7
Food stores	173	3	3,507	4.9	1.9
Automotive dealers and service stations	98	2	2,165	4.5	2.4
Eating and drinking places	166	3	6,483	2.6	1.4
Finance, insurance, and real estate	114	2	7,862	1.5	1.2
Services	767	13	35,008	2.2	.5
Business services	168	3	5,680	3.0	1.5
Automotive repair, services, and parking	103	2	1,618	6.4	2.8
Government[5]	591	10	–	–	–
Federal	178	3	19,525	3.0	.8
State	127	2	4,583	3.9	1.6
Local	284	5	5,150	2.5	1.5

[1] Based on the *Standard Industrial Classification Manual,* 1987 Edition.

[2] The employment figures, except for military, are annual average estimates of employed civilians 16 years of age and older, from the Current Population Survey (CPS), 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. There were 27 fatally injured workers under the age of 16 years who were not included in the rate calculations to maintain consistency with the CPS employment figures.

[4] The relative standard errors of the CPS employment estimates can be used to approximate confidence ranges for the fatality rates. For example, a confidence range for the mining rate can be approximated as follows: 26.8 x .047 x 1.6 = 2.0, where 26.8 = the rate, .047 = the relative standard error (4.7 percent), and 1.6 = the factor for a 90 percent confidence level. The confidence range for this rate is 24.8 to 28.8 (26.8 plus or minus 2.0).

[5] Includes fatalities to workers employed by governmental organizations regardless of industry.

NOTE: Totals for major categories may include subcategories not shown separately. There were 54 fatalities for which there was insufficient information to determine a specific industry classification, though a distinction between private and government was made for each.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, Census of Fatal Occupational Injuries, 1996.

Table 3. Number, rate, and relative risk of fatal occupational injuries for selected occupations, 1996

Occupation[1]	Number of fatalities	Employment (thousands)[2]	Fatalities per 100,000 workers[3]	Relative standard error[4] (percent)	Index of relative risk[5]	Most frequent fatal event (percent)
Total	6,112	127,997	4.8	0.2	1.0	Highway (22)
Truckdrivers	785	3,019	26.0	2.0	5.5	Highway (65)
Farming occupations	569	2,212	24.8	2.4	5.2	Vehicular (44)
Construction laborers	291	809	35.7	3.9	7.5	Vehicular (29)
Sales, supervisors and proprietors	225	4,501	5.0	1.7	1.0	Homicide (65)
Laborers, except construction	213	1,334	15.9	3.1	3.3	Vehicular (29)
Military	123	1,289	9.5	3.1	2.0	Aircraft crashes (60)
Timber cutting and logging	118	75	157.3	13.0	33.1	Struck by object (76)
Police and detectives	114	960	11.9	3.6	2.4	Homicide (48)
Airplane pilots and navigators	100	114	87.7	10.5	18.5	Aircraft crashes (100)
Electricians	98	763	12.8	4.1	2.6	Electrocutions (50)
Guards	97	811	12.0	3.9	2.4	Homicide (54)
Cashiers	94	2,856	3.3	2.1	.7	Homicide (90)
Groundskeepers and gardeners	90	875	10.3	3.8	2.2	Vehicular (26)
Carpenters	87	1,220	7.1	3.2	1.5	Falls (57)
Extractive occupations	87	130	66.9	9.8	14.1	Vehicular (26)
Managers, food serving and lodging	75	1,383	5.4	3.0	1.1	Homicide (88)
Fishers	66	37	178.4	18.5	37.5	Drowning (74)
Taxicab drivers and chauffeurs	65	203	32.0	7.9	6.7	Homicide (71)
Janitors and cleaners	63	2,205	2.9	2.4	.6	Falls (21)
Welders and cutters	62	605	10.2	4.6	2.2	Falls (27)
Roofers	61	197	31.0	8.0	6.5	Falls (67)
Food preparation and service occupations	53	5,906	.9	1.4	.2	Homicide (80)
Structural metal workers	52	61	85.2	14.4	17.9	Falls (77)
Industrial truck and tractor operators	46	512	9.0	5.0	1.9	Vehicular (54)
Painters, construction and maintenance	45	504	8.9	5.0	1.9	Falls (56)
Water transportation occupations	42	69	60.9	13.5	12.8	Fall from ship (36)
Social, recreation, and religious workers	41	1,332	3.1	3.1	.6	Highway (39)
Heavy equipment mechanics	38	156	24.4	9.0	5.1	Contact with object (34)
Electrical power installers and repairers	38	126	30.2	10.0	6.3	Electrocutions (61)
Operating engineers	38	245	15.5	7.2	3.3	Highway (29)
Public transportation attendants	38	95	40.0	11.5	8.4	Aircraft crashes (92)
Firefighting and fire prevention occupations	37	231	16.0	7.4	3.2	Highway (38)
Automobile mechanics	35	889	3.9	3.8	.8	Struck by (29)
Driver-sales workers	35	156	22.4	9.0	4.7	Highway (54)
Bus, truck, and stationary engine mechanics	34	336	10.1	6.1	2.1	Struck by (24)
Plumbers, pipefitters, steamfitters	32	555	5.8	4.8	1.2	Falls (19)
Electrical and electronic equipment repairers	31	662	4.7	4.4	1.0	Transportation (55)
Precision metal working occupations	30	910	3.3	3.7	.7	Contact with object (33)
Health assessment and treating occupations	27	2,812	1.0	2.1	.2	Highway (52)
Excavating and loading machine operators	26	92	28.3	11.7	5.9	Contact with object (39)
Teachers, except postsecondary	24	4,724	.5	1.6	.1	Aircraft crashes (29)
Nursing aides, orderlies, and attendants	23	1,850	1.2	2.6	.3	Highway (52)
Athletes	23	85	27.1	12.2	5.7	Vehicular (39)
Stock handlers and baggers	22	1,106	2.0	3.4	.4	Homicide (55)
Rail transportation occupations	22	115	19.1	10.5	4.0	Railway collision (41)
Managers, properties and real estate	21	530	4.0	4.9	.8	Homicide (43)
Heating, air conditioning mechanics	21	304	6.9	6.4	1.5	Electrocutions (29)
Garbage collectors	21	43	48.8	17.1	10.3	Vehicular (81)
Industrial machinery repairers	20	540	3.7	4.8	.8	Struck or crushed by (45)
Plant and system operators	20	260	7.7	7.0	1.6	Electrocutions (30)

[1] Based on the 1990 Occupational Classification System developed by the Bureau of the Census. Selected occupations had 20 or more work injury fatalities in 1996.

[2] The employment figures, except for military, are annual average estimates of employed civilians 16 years of age and older, from the Current Population Survey (CPS), 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. There were 27 fatally injured workers under the age of 16 years who were not included in the rate calculations to maintain consistency with the CPS employment figures.

[4] The relative standard errors of the CPS employment estimates can be used to approximate confidence ranges for the fatality rates. For example, a confidence range for the roofers rate can be approximated as follows: 31.0 x .08 x 1.6 = 4.0, where 31.0 = the rate, .08 = the relative standard error (8.0 percent), and 1.6 = the factor for a 90 percent confidence level. The confidence range for this rate is 27.0 to 35.0 (31.0 plus or minus 4.0).

[5] Index of relative risk = Fatality rate for a given occupation/Fatality rate for all workers.

SOURCE: Bureau of Labor Statistics, U.S. Department of Labor, Census of Fatal Occupational Injuries, 1996.