



Workplace  
Safety and Health

## Transportation, Warehousing, and Utilities (NAICS 48, 49, 22)

Number, Rate, and Costs of Occupational Fatal Injuries in the U.S. Transportation, Warehousing, and Utilities Industry Sector by Selected Characteristics, 2003-2006

Characteristic	Number of fatalities	Fatality rate (per 100,000 workers)	Costs (2006 Dollars)		
			Mean (thousands)	Median (thousands)	Total (millions)
<b>All U.S. Industries</b>	22,197	3.9	\$960	\$944	\$21,316
<b>All Transportation, Warehousing, and Utilities</b>	3,704	12.9	944	974	3,496
<b>Industry Sector<sup>1</sup></b>					
Utilities	225	4.8	1,250	1,290	281
Air Transportation	179	7.7	1,397	1,242	250
Rail Transportation	82	7.6	1,036	972	85
Water Transportation	112	45.2	1,051	1,040	118
Truck Transportation	2,167	27.8	902	1,000	1,954
Transit and Ground					
Passenger Transportation	296	9.9	692	730	205
Pipeline Transportation	10	9.0	808	786	8
Scenic and Sightseeing					
Transportation	31	23.2	1,145	1,082	36
Support Activities for					
Transportation	319	13.5	969	1,021	309
Postal Service	70	2.1	1,022	1,114	72
Couriers and Messengers	119	4.6	844	825	100
Warehousing and Storage	86	7.7	828	822	71
<b>Year</b>					
2003	863	12.4	917	940	792
2004	926	13.2	966	999	895
2005	958	13.0	927	970	888
2006	957	12.8	963	997	921
<b>Sex</b>					
Male	3,526	16.1	935	969	3,298
Female	178	2.6	1,113	1,085	198
<b>Age Group</b>					
16-19	17	4.8	843	793	14
20-24	126	8.0	1,111	1,073	140
25-34	593	11.1	1,247	1,197	739
35-44	910	11.4	1,240	1,189	1,129
45-54	1,067	12.6	978	946	1,043
55-64	733	17.4	554	542	406
65+	258	31.0	97	71	25



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## Transportation, Warehousing, and Utilities (continued)

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Characteristic	Number of fatalities	Fatality rate (per 100,000 workers)	Costs (2006 Dollars)		
			Mean (thousands)	Median (thousands)	Total (millions)
<b>Race</b>					
White	2,968	13.1	950	984	2,821
Black	502	11.0	872	908	438
Other <sup>2</sup>	234	14.4	1,015	1,045	237
<b>Ethnicity<sup>1</sup></b>					
Not Hispanic	3,291	13.1	937	964	3085
Hispanic	375	10.5	1,006	1,067	377
<b>Selected SOC Occupation Group</b>					
Construction and Extraction	60	9.1	1,064	1,121	64
Installation, Maintenance, and Repair	189	9.2	1,208	1,253	228
Management	41	1.9	1,537	1,580	63
Office and Administrative Support	108	1.5	894	830	97
Production	54	4.7	1,011	1,064	55
Transportation and Material Moving	3,184	26.4	915	956	2,913
<b>Event or Exposure<sup>1</sup></b>					
0* Contact with objects and equipment	350	1.2	896	930	314
1* Falls	157	0.5	739	726	116
2* Bodily reaction and exertion	6	0.02	941	909	6
3* Exposure to harmful substance or environment	171	0.6	1,188	1,193	203
4* Transportation accidents	2,697	9.4	952	996	2,569
5* Fires and explosions	47	0.2	1,105	1,076	52
6* Assaults and violent acts	275	1.0	861	807	237
<b>Source of Injury<sup>1</sup></b>					
0* Chemicals and chemical products	61	0.2	1,083	1,094	66,071
1* Containers	62	0.2	812	802	50,347
3* Machinery	66	0.2	882	897	58,204
4* Parts and materials	162	0.6	1,117	1,139	181,015
5* Persons, plants, animals, and minerals	36	0.1	909	959	32,738
6* Structures and surfaces	178	0.6	785	786	139,647
7* Tools, instruments, and equipment	23	0.1	810	771	18,639
8* Vehicles	2,844	9.9	951	998	2,703,808

NOTE: Asterisks denote a summary level code not assigned to individual cases.

<sup>1</sup>Numbers are not reported for “unknown”, “not classified”, “unspecified”, “not reported” or “other” categories.

<sup>2</sup>This category includes all other races, such as American Indian and Asian, as well as unknown or missing races.

# Fatal Occupational Injury Cost Model

## Theoretical Basis of Cost Estimation

The cost to society of a workplace fatality was estimated using the cost-of-illness approach, which combines direct and indirect costs to yield an overall cost of an occupational fatal injury. For these calculations, only medical expenses were used to estimate the direct cost associated with the fatality. The indirect cost was derived by calculating the present value of future earnings summed from the year of death until the decedent would have reached age 67, accounting for the probability of survival were it not for the premature death. (For more information, see Biddle, E [2004]. Economic Cost of Fatal Occupational Injuries in the United States, 1980–1997. Contemporary Economic Policy 22(3):370–381 or Biddle, E [2009]. The Cost of Fatal Injuries to Civilian Workers in the US, 1992-2001 and Biddle E and Keane P [2011]. The Economic Burden of Occupational Injuries to Civilian Workers in the United States, 1992-2002. Cincinnati, OH: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health, DHHS.)

## Mathematical Representation of Indirect Costs

$$PVF = \sum_{n=y}^{67} P_{y,q,s}(n) [Y_{s,j}(n) + Y_s^h(n)] * (1+g)^{n-y} / (1+r)^{n-y} \quad \text{where:}$$

PVF	= present discounted value of loss per person due to an individual occupational fatal injury
$P_{y,q,s}(n)$	= probability that a person of age y, race q, and sex s will survive to age n
q	= race of the individual
s	= sex of the individual
n	= age if the individual had survived
$Y_{s,j}(n)$	= median annual compensation of an employed person of sex s, specific occupation j, and age n (includes median annual earnings, benefits, and wage growth adjustments)
j	= specific occupation of individual at death
$Y_s^h(n)$	= mean annual imputed value of household production (h) of a person of sex s and age n
g	= earnings growth rate attributable to overall productivity
y	= age of the individual at death
r	= real discount rate (3%)

## Data Sources

**Fatality data:** Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI). This research was conducted with restricted access to Bureau of Labor Statistics (BLS) data. These data exclude military personnel, decedents with unknown age or sex, and fatalities occurring in New York City. The views expressed here do not necessarily reflect the views of the BLS.

**Probability of survival:** National Center for Health Statistics, Division of Vital Statistics.

**Median annual earnings:** BLS Occupational Employment Statistics Survey. Wage data are based on the occupation of the decedent and the year and State of death adjusted by the Gross Domestic Product (GDP) Deflator to the base year of dollar. The wage growth adjustment, which is the rate of change in wages between age groups, was calculated by NIOSH using BLS Current Population Survey data.

**Benefits:** BLS Employer Cost for Employee Benefits. Benefits data are based on the year of death adjusted by the GDP Deflator.

**Mean annual home production:** Expectancy Data. Data are derived through a time diary study sponsored by the U.S. Environmental Protection Agency and conducted by the University of Maryland.

**Earnings growth rate:** BLS Employment Compensation Index (ECI).

**Medical costs:** National Council on Compensation Insurance. This is a single 4-year average medical cost.

**Employment estimates for rate calculations:** BLS Current Population Survey.

## Fatality Rate Calculations

Fatality rates were calculated by NIOSH and may differ from previously published BLS CFOI rates.

Fatality rates were calculated as deaths per 100,000 workers. Fatality rates for sex, race, age group, and occupation were calculated using employment estimates by the individual characteristic within the specific industry. Employment estimates for the specific industry were used to generate rates for event and source.

## Classification Systems

**Industry:** 2002 National Industry Classification System (NAICS)

**Occupation:** 2000 Standard Occupational Classification System (SOC)

**Event and Source:** 1992 BLS Occupational Injury and Illness Classification System (OIICS)