CDC Workplace Safety and Health

Agriculture, Forestry, and Fishing

Number, rate, and costs of fatal occupational injuries in the U.S. agriculture, forestry, and fishing industry by selected characteristics, 1992–2002

Characteristic	Number of fatalities	Fatality rate (per 100,000 workers)	Costs (2003 dollars)		
			Total (millions)	Mean (thousands)	Median (thousands)
All incidents	8,726	24.0	$4,564	$530	$608
Sex:					
Male	8,458	30.9	4,407	528	605
Female	268	3.0	157	590	669
Race of decedent:					
White	7,763	22.8	3,982	520	588
Black	381	27.5	214	562	625
Other*	582	62.4	369	634	678
Age of decedent:					
16–19	257	9.8	154	598	565
20–24	552	15.8	394	714	664
25–34	1,290	16.3	1,061	822	727
35–44	1,580	18.6	1,334	844	732
45–54	1,400	22.9	981	700	630
55–64	1,425	32.1	513	360	338
65+	2,222	65.9	128	61	55
Occupation group:†					
Managerial and professional specialty	119	5.5	149	1,261	1,388
Technical, sales, and administrative support	186	8.0	267	1,435	1,605
Service	48	24.4	37	791	747
Farming, forestry, and fishing	7,936	26.1	3,774	482	582
Precision production, craft, and repair	61	13.5	53	870	964
Operators, fabricators, and laborers	358	42.1	268	753	805
Event or exposure:†					
Contact with objects and equipment	2,023	5.6	982	492	574
Falls	656	1.8	346	532	608
Bodily reaction and exertion	7	0.0	4	643	641
Exposure to harmful substances or environments	870	2.4	564	649	680
Transportation accidents	4,426	12.2	2,281	523	582
Fires and explosions	129	0.4	62	500	525
Assaults and violent acts	601	1.7	319	538	623

*This category includes all other races, such as American Indian and Asian, as well as unknown or missing races.
†Numbers are not reported for "unknown" or "not classified" categories.

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

NIOSH

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.)

Mathematical Representation of Indirect Costs

$$PVF = \sum P_{y,s}\,(y+1)[Y_{s,j}(n) + Y_{hs}(n)]\,(1+g)^{n-y}/(1+r)^{n-y}$$

where:

PVF	= present discounted value of loss due to occupational fatal injury per person
$P_{y,s}\,(y+1)$	= probability that a person of race r, sex s, and age y will survive to age y+1
y	= age of the person at death
s	= sex of the person
n	= age if the person had survived
$Y_{s,j}(n)$	= median annual earnings of an employed person of sex s, occupation j, and age n (includes benefits and life-cycle wage growth adjustment)
$Y_{hs}(n)$	= mean annual imputed value of home production of a person of sex s and age n
g	= wage growth rate attributable to overall productivity
r	= real discount rate (3%)

Data Sources

Fatality data: Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI). These data exclude military personnel, decedents with unknown age or sex, fatalities occurring in New York City, and fatalities from the September 11, 2001, terrorist attacks.
Probability of survival: National Center for Health Statistics, Division of Vital Statistics.
Median annual earnings: BLS Current Population Survey. Wage data are based on the occupation of the decedent and the year of death adjusted by Gross Domestic Product (GDP) Deflator to base year of dollar. Life-cycle wage growth was calculated based on the rate of change in wages between age groups.
Benefits: U.S. Chamber of Commerce. Benefits data are based on the industry where the decedent was employed and the year of death adjusted by the GDP Deflator.
Mean annual home production: Expectancy Data that were derived by a time diary study sponsored by the U.S. Environmental Protection Agency and conducted by the University of Maryland.
Wage growth rate: Based on BLS Employment Cost Index (ECI)
Medical costs: National Council on Compensation Insurance. Costs are a 3-year average 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 sector. Employment estimates for the specific industry sector were used to generate rates for event.

Classification Systems

Industry:	1987 Standard Industrial Classification System (SIC)
Occupation:	1990 Bureau of Census Occupational Classification System (BOC)
Event:	1992 BLS Occupational Injury and Illness Classification System (OIICS)