

Three Measures of Nonfatal Injuries at Work

BY MARTIN E. PERSONICK

"Injury at work" conjures up images of workers killed, permanently impaired, or suffering a temporary disabling injury resulting in lost worktime.¹ These images are similar to the actual types of injuries reported by employers in the BLS surveys. Although death and disability are the most serious outcomes of work-related injuries, many safety and health experts suggest that other incidents merit study. For example, injuries can be serious enough to require medical treatment or a temporary change of job duties or schedule, or both. However, it took an Act of Congress to enable BLS to measure the frequency of "all disabling, serious, or significant injuries and illnesses, whether or not involving loss of time from work."²

This article summarizes trends in incidence rates for the three classes of nonfatal injuries measured by BLS: Cases with days away from work; cases resulting in restricted work activity only; and cases without any lost or restricted workdays. Industries with the highest rates for each of the three classifications of nonfatal injury are also identified and discussed.

Definitions

The Department of Labor defines the three classes of nonfatal injuries as:³

Injuries involving days away from work result in time away from work, beyond the day of the incident. Such cases may also result in days of restricted work activity and/or medical treatment.

Injuries involving days of restricted work activity only result in days of restricted work or motion, be-

yond the day of the incident. Such cases may also require medical treatment, but do not require days away from work.

Restricted work activity meets at least one of the following criteria:

1. The employee was assigned to another job on a temporary basis due to injury;
2. The injured employee was assigned a shortened work schedule; or,
3. The injured employee worked a regularly-assigned job, but could not perform all of the duties normally associated with it.

Injuries without lost or restricted workdays typically require medical treatment other than first aid.⁴ These cases include loss of consciousness.

Injury trends

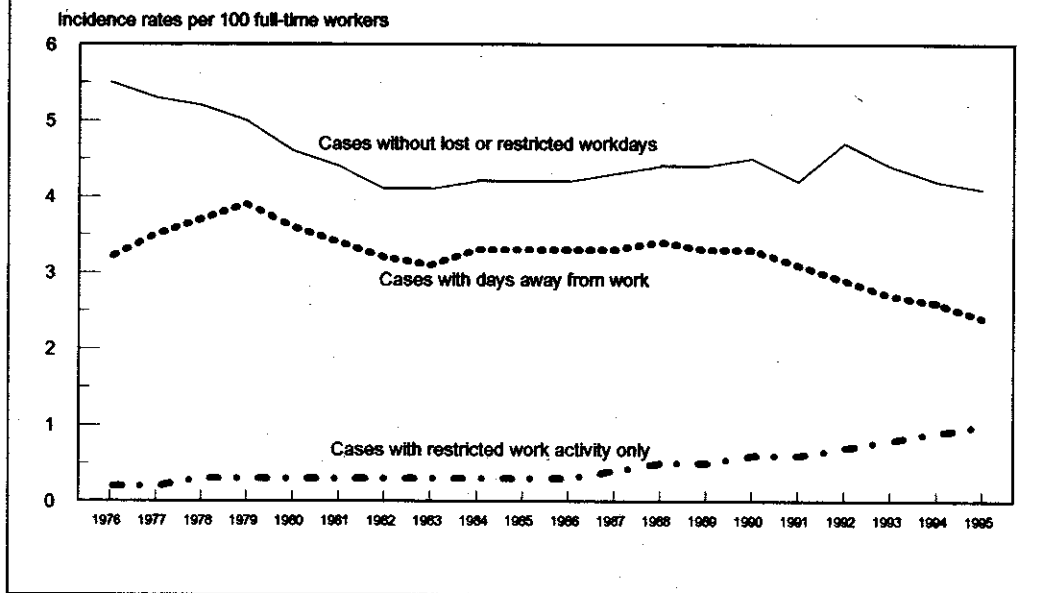
The timing and direction of changes in nonfatal injury rates vary by the type of case. As of 1995, each type of injury contributes a distinct portion of total injuries: A third for days-away-from-work cases, an eighth for restricted-work-activity cases, and slightly over half for cases without lost or restricted workdays.

Although rates for injuries resulting in missed workdays are lower now than they were 20 years ago, there were periods of rate declines and rate increases during the two-decade span. The lost-worktime case rate slightly rose during the late 1970s to 3.9 per 100 equivalent full-time workers in 1979, then declined during the early 1980s to a rate of 3.1 before edging up to 3.4 per 100 workers in 1988. Since then, lost-worktime rates have declined steadily to their lowest level, 2.4 per 100 workers in 1995. (See table 1 and chart 1.)

In contrast to lost-worktime incidents, rates for injuries involving restrictions to a workers' duties were much higher in 1995 (1 case per 100 full-time workers) than in 1976

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Chart 1. Incidence rates for work injuries in private industry, by type of case, 1976-95



(0.2 per 100 workers). Almost all of the increase took place since 1986, while at the same time the Federal Occupational Safety and Health Administration stepped up efforts to educate employers to recognize such cases. In 1995, these cases accounted for more than 13 percent of all non-fatal injuries, compared with fewer than 5 percent in 1986.

Rates for cases without lost or restricted workdays were lower in 1995 than in 1976, usually tracking the longer-term trend for lost-worktime injuries. But there were differences between the two trends within that 20-year period. Rates declined from 5.5 cases per 100 workers in 1976 to 4.1 cases in 1982 for injuries without lost or restricted workdays. During most of the 1980s and early 1990s the rates rose, peaking at 4.7 in 1992. Since then, rates have dropped to 4.1 per 100 workers in 1995.

A variety of factors influence the level of injury rates over time. These include shifts in the industrial and occupational composition of the workforce, changes in the level of business activity, working conditions and work practices, the number of hours worked, worker experience and training, the regulatory environment, and employers' understanding of the types of cases to record under current recordkeeping guidelines. When the country is experiencing a recession, as in the early 1980s, injury rates tend to decline. This is due in part because less experienced workers, who are relatively injury-prone, tend to be laid off before experienced workers. In the recovery employers hire new workers and injury rates rise.⁵ The effect of the aforementioned business cycle is evident for days-away-from-work cases and for cases with lost or restricted workdays, but not for injuries involving restricted work activity only.

Industry injury rates

The rate of work injury varies by industry division and type of case. For all types of injuries combined, construction and manufacturing had higher rates in 1995 (10.4 and 9.9, respectively) than other industry divisions; for injuries with missed workdays, construction and transportation/public utilities dominated the list (rates of 4.1 and 3.7); for cases with restricted work activity, manufacturing and transportation/public utilities led (2.0 and 1.3); and for cases without lost or restricted workdays, construction and manufacturing ranked highest (5.7 and 5.3). Manufacturing's rate of restricted-workday injuries was twice the combined total industry rate, suggesting that manufacturing workers are at much higher risk of such injuries than workers in other industries. (See table 3.)

Although manufacturing industries filled almost all of the top 10 rankings for injuries involving restricted work activity only and those without lost or restricted workdays, non-factory work settings mostly had the highest rates of lost-worktime injuries. (See table 2.) Five manufacturing industries—Ship and boat building, wood buildings and mobile homes, flat glass, secondary nonferrous metals, and motor vehicles and equipment—appeared on the lists of rates for restricted work activity cases and cases without lost or restricted work days. Only the secondary nonferrous metal industry was cited on all three lists.⁶

Establishment employment size

Taken together, the three measures of work injuries comprise a distinctive pattern by establishment employment size. All-industry rates rise from the smallest size to the mid-size

establishment, then decrease from mid-size to the largest-size groupings, as shown below for total nonfatal work injuries per 100 full-time workers in 1995.

<i>Employment size</i>	<i>Injury rate</i>
All sizes	7.5
1 to 10 workers	3.0
11 to 49 workers	6.5
50 to 249 workers	9.6
250 to 999 workers	8.5
1,000 or more workers	7.8

This pattern holds for injuries involving workdays lost and for injuries without lost or restricted workdays, although injuries involving restricted work activity have rates that are higher in large establishments than those in mid-size or small-size ones. (See table 3.) Small-size establishments barely registered a rate for injuries resulting from restricted work activity, suggesting that they are unfamiliar with or unable to provide light work duties or schedules to injured workers. For each type of injury, size patterns by industry division commonly correspond with all-industry patterns.

Survey scope and methods

The Survey of Occupational Injuries and Illnesses is a Federal/State program in which employer reports are collected from about 250,000 private industry establishments and processed by State agencies affiliated with the Bureau of Labor Statistics. Occupational injury and illness data for coal, metal, and nonmetal mining and for railroad ac-

tivities are provided by the Department of Labor's Mine Safety and Health Administration and the Department of Transportation's Federal Railroad Administration. The survey excludes all fatalities at work and work-related non-fatal injuries and illnesses to the self-employed; workers on farms with fewer than 11 employees; private household workers; and employees in Federal, State, and local government agencies.

The survey estimates of occupational injuries and illnesses are based on a selected probability sample, rather than a census of the entire population. These sample-based estimates may differ from results obtained from a population census. The variation in the sample estimates across all possible samples that could have been drawn is measured by the standard error. For example, the 1995 rate of 6.0 per 100 full-time workers for injuries resulting in restricted work activity in ship and boat building and repairing has an estimated relative standard error of about 2.7 percent or a standard error of less than 0.2.

The data are also subject to nonsampling error, such as mistakes in recording data or in transcribing the data to BLS survey forms. BLS also has quality assurance procedures in order to minimize nonsampling errors in the survey.

Beginning with the 1995 survey, modifications were made in the methodology used to adjust for survey nonresponse and data outliers and to benchmark the survey results. These changes had a minimal impact on the survey estimates.

—ENDNOTES—

¹ Because work-related illnesses continue to be difficult to recognize and report, illness data were not combined with injury data cited in this article. Injuries account for more than 90 percent of the injury and illness totals reported in the Bureau's safety and health surveys.

² The Occupational Safety and Health Act of 1970 (Public Law 91-596), section 24(a).

³ See *Recordkeeping Guidelines for Occupational Injuries and Illnesses* (U.S. Department of Labor, Bureau of Labor Statistics, September 1986), pp. 59-68. Photocopies of these excerpts are available upon request to the Bureau's

Office of Safety, Health and Working Conditions.

⁴ See *Recordkeeping Guidelines*, p. 79, for recordkeeping distinction for medical treatment and first aid.

⁵ For more discussion of the possible effects of the business cycle and other factors on injury rates, see U.S. Department of Labor, *Report on the American Workforce*, 1994, chapter 3, pp. 97-99.

⁶ Establishments classified in this industry are primarily engaged in recovering nonferrous metals and alloys from new and used scrap and dross or in producing alloys from purchased refined metals.

Table 1. Incidence rates for work injuries in private industry, by type of case,¹ 1976-95²

Year	Cases per 100 full-time workers ³			
	Total injuries	With days away from work	With days of restricted work activity only	Without lost or restricted workdays
1976	8.9	3.2	0.2	5.5
1977	9.0	3.5	.2	5.3
1978 ⁴	9.2	3.7	.3	5.2
1979 ⁴	9.2	3.9	.3	5.0
1980	8.5	3.6	.3	4.6
1981	8.1	3.4	.3	4.4
1982 ⁴	7.6	3.2	.3	4.1
1983 ⁴	7.5	3.1	.3	4.1
1984	7.8	3.3	.3	4.2
1985	7.7	3.3	.3	4.2
1986	7.7	3.3	.3	4.2
1987	8.0	3.3	.4	4.3
1988	8.3	3.4	.5	4.4
1989	8.2	3.3	.5	4.4
1990	8.3	3.3	.6	4.5
1991	7.9	3.1	.6	4.2
1992	8.3	2.9	.7	4.7
1993	7.9	2.7	.8	4.4
1994	7.7	2.6	.9	4.2
1995	7.5	2.4	1.0	4.1

¹ Three types of nonfatal injuries are included in the BLS survey: Cases with days away from work, which may also involve days of restricted work activity; cases with restricted work activity that do not involve missed workdays; and cases without lost or restricted work activity, which primarily involve medical treatment beyond first aid.

² Data for 1976-1987 are based on the *Standard Industrial Classification Manual*, 1972 Edition; and data for 1988-1995 are based on the *Standard Industrial Classification Manual*, 1987 Edition.

³ Cases per 100 full-time workers were calculated as: (N/EH) x 200,000, where:

N = number of injuries by type of injury

EH = total hours worked by all employees during the calendar year
 200,000 = base for 100 equivalent full-time workers (working 40 hours per week, 50 weeks per year).

⁴ To maintain historical comparability with the rest of the series, data for small nonfarm employers in low-risk industries that were not surveyed were imputed and included in the survey estimates.

NOTE: The 1992-95 surveys measured only non-fatal injuries while prior BLS annual surveys covered both fatal and non-fatal injuries. Because fatalities account for less than 0.1 percent of total injuries, they have little or no impact on the total injury incidence rate.

Table 2. Private sector industries with the highest incidence of work injuries, by type of case,¹ 1995

Type of case, industry, and (SIC code) ²	Annual average employment ³ (in thousands)	Cases per 100 full-time workers ⁴
Days away from work		
Total, all industries	96,886.0	2.4
Anthracite coal mining (123)	1.3	9.2
Secondary nonferrous metals (334)	15.8	8.3
Trucking terminal facilities (423)	4.4	7.7
Air transportation, scheduled (451)	626.3	6.9
Roofing, siding, and sheet metal work (176)	208.3	6.7
Wood containers (244)	50.6	6.5
Local and suburban transportation (411)	181.2	6.3
Bituminous coal and lignite mining (122)	97.3	6.2
Logging (241)	82.0	6.1
Trucking/courier services, exc. air (421)	1,728.1	5.9
Restricted work activity only		
Total, all industries	96,886.0	1.0
Ship and boat building and repairing (373)	158.3	6.0
Meat products (201)	470.5	5.3
Tires and inner tubes (301)	80.0	5.1
Wood buildings and mobile homes (245)	80.6	4.9
Iron and steel foundries (332)	130.2	4.2
Leather tanning and finishing (311)	13.7	3.9
Flat glass (321)	15.3	3.9
Secondary nonferrous metals (334)	15.8	3.9
Public building and related furniture (253)	42.7	3.7
Motor vehicles and equipment (371)	967.6	3.7
Without lost or restricted workdays		
Total, all industries	96,886.0	4.1
Iron and steel foundries (332)	130.2	14.2
Wood buildings and mobile homes (245)	80.6	12.9
Ship and boat building and repairing (373)	158.3	12.5
Secondary nonferrous metals (334)	15.8	12.1
Flat glass (321)	15.3	10.9
Metal forgings and stampings (346)	251.5	10.7
Nonferrous foundries (336)	86.9	9.6
Motor vehicles and equipment (371)	967.6	9.5
Nursing homes (805)	1,692.5	9.2
Fabricated structural metal products (344)	427.9	9.2

¹ Cases with days away from work may also involve days of restricted work activity. Cases with restricted work activity only, by definition, do not involve missed workdays. Cases without lost or restricted workdays primarily involve medical treatment beyond first aid.

² *Standard Industrial Classification Manual*, 1987 Edition.

Ranking of industry rates is at a three-digit level, as defined in the Manual.

³ Annual average employment is derived primarily from the BLS Covered Employment and Wages program.

⁴ See table 1 for method of calculation.

Table 3. Incidence rates per 100 full-time workers¹ for work injuries in private industry, by employment size group and type of case,² 1995

Type of case and industry division	Establishment employment size (workers)					
	All establishments	1 to 10	11 to 49	50 to 249	250 to 999	1,000 or more
Days away from work						
Private industry ³	2.4	1.2	2.3	3.1	2.5	2.1
Agriculture, forestry, fishing ³	3.3	2.6	3.4	3.6	3.3	3.4
Mining ⁴	3.2	2.4	3.6	3.4	2.7	—
Construction.....	4.1	3.2	4.8	4.5	2.9	.7
Manufacturing.....	2.6	1.9	3.1	3.3	2.3	1.8
Durable goods.....	2.8	2.4	3.6	3.7	2.4	2.0
Nondurable goods.....	2.3	1.1	2.2	2.9	2.1	1.5
Transportation, public utilities ⁴	3.7	1.7	3.4	4.5	3.7	3.8
Wholesale and retail trade.....	2.3	1.1	2.1	2.9	3.2	2.1
Finance, insurance, real estate.....	.7	.6	.8	.9	.7	.4
Services.....	2.0	.7	1.4	2.7	2.3	2.3
Restricted work activity only						
Private industry ³	1.0	.2	.5	1.2	1.6	1.6
Agriculture, forestry, fishing ³.....	.9	.2	.7	1.2	1.3	1.9
Mining ⁴.....	.6	.2	.4	.8	.6	—
Construction.....	.7	.2	.6	.9	1.4	.8
Manufacturing.....	2.0	.3	1.0	2.1	2.2	2.3
Durable goods.....	2.0	.3	1.1	2.3	2.2	2.2
Nondurable goods.....	1.9	.3	.8	1.9	2.3	2.4
Transportation, public utilities ⁴	1.3	.2	.5	1.1	1.5	2.6
Wholesale and retail trade.....	.8	.3	.4	1.1	1.8	1.3
Finance, insurance, real estate.....	.2	.3	.1	.2	.2	.1
Services.....	.7	.1	.3	1.1	1.0	1.1
Without lost or restricted workdays						
Private industry ³	4.1	1.6	3.7	5.3	4.4	4.1
Agriculture, forestry, fishing ³	5.1	3.3	5.6	5.9	4.7	3.6
Mining ⁴	2.2	1.6	2.7	2.4	1.7	—
Construction.....	5.7	3.0	6.7	6.9	5.3	1.3
Manufacturing.....	5.3	2.4	5.5	6.3	4.8	5.2
Durable goods.....	6.2	3.2	6.7	7.4	5.3	5.9
Nondurable goods.....	4.2	1.2	3.6	5.0	4.1	3.6
Transportation, public utilities ⁴	3.7	1.9	3.5	4.8	3.3	3.4
Wholesale and retail trade.....	4.2	1.5	3.8	5.7	5.3	4.2
Finance, insurance, real estate.....	1.4	.9	1.6	1.8	1.6	1.0
Services.....	3.4	1.1	2.3	4.8	4.4	4.0

¹ See table 1 for method of calculation.

² Cases with days away from work may also involve days of restricted work activity. Cases with restricted work activity only, by definition, do not involve missed workdays. Cases without lost or restricted workdays primarily involve medical treatment beyond first aid.

³ Excludes farms with fewer than 11 employees.

⁴ Data conforming to OSHA definitions for mining operators in coal, metal, and nonmetal mining and for employers in railroad transporta-

tion are provided to BLS by the Mine Safety and Health Administration, U.S. Department of Labor; and the Federal Railroad Administration, U.S. Department of Transportation. Independent mining contractors are excluded from the coal, metal, and nonmetal mining industries.

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