

Injuries at Work in the US Adult Population: Contributions to the Total Injury Burden

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In 1997, an estimated 34.4 million medically treated injuries and poisonings occurred in the United States—a rate of 12.9 episodes per 100 persons.¹ Injuries to working-age adults, which represent an important part of this injury burden, are often overlooked despite having a larger economic impact than injuries to other age groups.² Until recently, comparable national data that distinguished work-related from non-work-related injuries were not available on the incidence and types of injuries to working-age adults. Moreover, existing workplace-based reporting systems may substantially underestimate occupational injuries.^{3–23} When adjustment is made for underreporting, annual estimates of nonfatal work-related injuries in the United States range from 6 million to 13 million.^{3,5} No comprehensive national data exist on nonfatal work-related injuries or even work-related injury hospitalizations.^{12–14}

The National Health Interview Survey (NHIS) is one of the most important tools for monitoring the health of the US population.^{24–27} It recently has been revised to improve the quality of data collected on injuries and includes work relatedness.¹ This revision now provides an opportunity to examine all injuries to adults in the US population and to assess those occurring at work, independent of workplace reporting. We used data from the redesigned NHIS for 1997–1999 to examine the contribution of nonfatal injuries at work to the total injury burden of working-age adults (aged 18–64 years).

METHODS

The NHIS is a nationwide survey conducted by the National Center for Health Statistics with trained interviewers from the Census Bureau. The survey provides health information about a nationally representative

Objectives. We estimated the contribution of nonfatal work-related injuries on the injury burden among working-age adults (aged 18–64 years) in the United States.

Methods. We used the 1997–1999 National Health Interview Survey (NHIS) to estimate injury rates and proportions of work-related vs non-work-related injuries.

Results. An estimated 19.4 million medically treated injuries occurred annually to working-age adults (11.7 episodes per 100 persons; 95% confidence interval [CI] = 11.3, 12.1); 29%, or 5.5 million (4.5 per 100 persons; 95% CI = 4.2, 4.7), occurred at work and varied by gender, age, and race/ethnicity. Among employed persons, 38% of injuries occurred at work, and among employed men aged 55–64 years, 49% of injuries occurred at work.

Conclusions. Injuries at work comprise a substantial part of the injury burden, accounting for nearly half of all injuries in some age groups. The NHIS provides an important source of population-based data with which to determine the work relatedness of injuries. Study estimates of days away from work after injury were 1.8 times higher than the Bureau of Labor Statistics (BLS) workplace-based estimates and 1.4 times as high as BLS estimates for private industry. The prominence of occupational injuries among injuries to working-age adults reinforces the need to examine workplace conditions in efforts to reduce the societal impact of injuries. (*Am J Public Health.* 2005;95:1213–1219. doi:10.2105/AJPH.2004.049338)

sample of the noninstitutionalized US civilian population.^{1,28,29} For each sampled household, in-person interviews are conducted with a resident adult who provides information on all household members. Information collected includes demographic and personal characteristics, health status, and use of health resources. Most analyses in this article were derived from data reported by the resident adult on behalf of all members of the family. However, to obtain the most accurate information on employment, occupation, industry, and other items, 1 adult in each household is randomly selected as the “sample” adult from whom data are gathered directly (data available as a separate sample adult file).

Beginning in 1997, more detailed information on injuries was collected by the NHIS.¹ Details concerning all medically treated injuries (including those injuries about which advice was received) during the past 3 months to any member of the household, including injuries related to any paid work, were obtained from the respondent through

a computer-assisted personal interview. Data from 1997 to 1999, the first 3 years of the redesigned survey, were combined to develop national estimates of nonfatal work-related and non-work-related injuries. The unit of analysis for the study was the injury episode; an injured person may have multiple episodes.

Injuries were defined as work related or at work if the response “Working at a paid job” was selected in answer to the question, “What were you doing when the injury happened?” Employed persons were defined as those who reported employment in a job or business during the week before the interview (regardless of whether they worked that week). It is possible that employment status changed between the time of the injury, which could be up to 3 months prior to the interview, and the week before the interview. Such a status change could result in some misclassification of employment status, but we assumed such changes to be minimal. We excluded all poisonings from

our analyses, because the NHIS asked separate questions for injuries and for poisonings and did not ascertain the work relatedness of poisonings during 1997–1999. Musculoskeletal disorders are also not included by definition.

Study Population

The working-age population was defined as persons aged 18 to 64 years. People younger than 18 years and people 65 years and older were excluded because of the small numbers of work-related injury episodes reported for these age groups ($n=19$ and 25 , respectively [unweighted]). A total of 113 614 households were surveyed by the NHIS during the 3 year-period, with an adult representative providing information for 298 388 household members; 99 357 sample adults were interviewed directly. The overall survey response rate for all ages was 90.3% in 1997, 88.2% in 1998, and 86.1% in 1999.^{29,30}

Data Analysis

The descriptive analysis was performed with SAS version 8.0 (SAS Institute Inc, Cary, NC). To derive national estimates, sample weights that accounted for the complex sample design of the survey were assigned by the National Center for Health Statistics for each respondent on the basis of the number and composition of households; these weights included adjustment for non-response.²⁹ Weights also were provided for the sample adults. The denominator population used for calculating injury rates was obtained directly from the survey.

The distribution of injuries was examined for all injury episodes by various characteristics and by work relatedness. Standard errors and 95% confidence intervals were calculated with SUDAAN software³¹ to account for the complex, multistage sample design used in the survey. Estimates with relative standard errors greater than 30% were considered unreliable. To identify contrasts between subpopulations that were both meaningful and significant, differences in injury rates and proportions were tested with a 2-sided z test at the 0.05 level of significance. Because multiple, simultaneous tests were performed, the Bonferroni method was used to provide a more conservative threshold for identifying significant differences. The trend in rates by

TABLE 1—Number, Percentage, and Rate of All Injury Episodes and Work-Related Injury Episodes Among the Working-Age Population (Aged 18–64 years), by Age, Gender, and Race/Ethnicity: National Health Interview Survey, 1997–1999

	All Injuries Annually		Work-Related Injuries Annually	
	No. in 1000s (%)	Rate per 100 Population ^a (95% CI)	No. in 1000s (%)	Rate per 100 Employed Population ^b (95% CI)
Age, y				
18–24	3807 (19.6)	14.9 (13.8, 16.1)	1088 (19.6)	6.6 (5.7, 7.5)
25–34	4858 (25.1)	12.5 (11.8, 13.3)	1561 (28.2)	5.0 (4.4, 5.5)
35–44	5191 (26.8)	11.7 (11.0, 12.5)	1401 (25.3)	3.8 (3.4, 4.2)
45–54	3576 (18.4)	10.4 (9.6, 11.1)	1069 (19.3)	3.9 (3.4, 4.4)
55–64	1961 (10.1)	8.8 (8.0, 9.6)	426 (7.7)	3.4 (2.7, 4.0)
Gender				
Male	11 189 (57.7)	13.8 (13.2, 14.4)	3863 (69.7)	5.8 (5.4, 6.2)
Female	8204 (42.3)	9.8 (9.3, 10.2)	1683 (30.3)	2.9 (2.6, 3.2)
Race/ethnicity				
White non-Hispanic	15 320 (79.0)	12.8 (12.3, 13.3)	4392 (79.2)	4.7 (4.4, 5.0)
Black non-Hispanic	2030 (10.5)	10.4 (9.5, 11.4)	542 (9.8)	4.0 (3.3, 4.7)
Hispanic	1438 (7.4)	7.9 (7.2, 8.7)	486 (8.8)	3.8 (3.3, 4.4)
Other	605 (3.1)	8.0 (6.5, 9.5)	126 (2.3)	2.3 (1.5, 3.2)
Total	19 393 (100.0)	11.7 (11.3, 12.1)	5546 (100.0)	4.5 (4.2, 4.7)

Note. CI = confidence interval.

^aAll people in the population aged 18 to 64 years regardless of employment ($n = 165$ million).

^bPeople who were reported to be employed at a job or business in the week before the interview ($n = 124$ million).

age group was tested by fitting a linear regression model weighted inversely to the variance of each rate. Tests of differences between estimates discussed in the text were conducted with these methods (results not shown).

RESULTS

Survey respondents reported a total of 4925 injury episodes (unweighted) among adults aged 18 to 64 years from 1997 to 1999. When weighted, these responses formed the basis of our national estimates. There were 1386 persons in the survey who were injured at work, resulting in 1422 work-related injury episodes (2.4% sustained 2 episodes during the 3-month period, and 2 people sustained 3 or more episodes).

Injury Estimates and Rates

The civilian, noninstitutionalized adult US population aged 18 to 64 years (approximately 165 million) sustained an estimated 19.4 million injury episodes annually, a rate of 11.7 per 100 persons (Table 1). About 5.5 million at-work injury episodes occurred an-

nually among the estimated 124 million people who were employed at the time of the interview, a rate of 4.5 per 100 employed persons. For men, the overall injury rate was 40% higher than the rate for women, but the work-related injury rate was double that of women. Overall injury rates decreased with age. The trend, however, was driven by the rate among men, because no trend by age was found among the rates for women (Figure 1). When stratified by gender, the rates for men were highest among those aged 18 to 24 years (Figure 1), both for all injuries (19.8 per 100) and for work-related injuries (9.2 per 100), and declined significantly by age. Non-Hispanic White adults had the highest injury rates, followed by non-Hispanic Black adults and Hispanic adults (Table 1). When the data were limited to work-related injuries, the order of the rates was the same, but the differences among racial/ethnic groups were smaller and nonsignificant. When rates were stratified by age and gender, differences in work-related injury rates by race/ethnicity persisted and were greatest among younger men (data not shown).

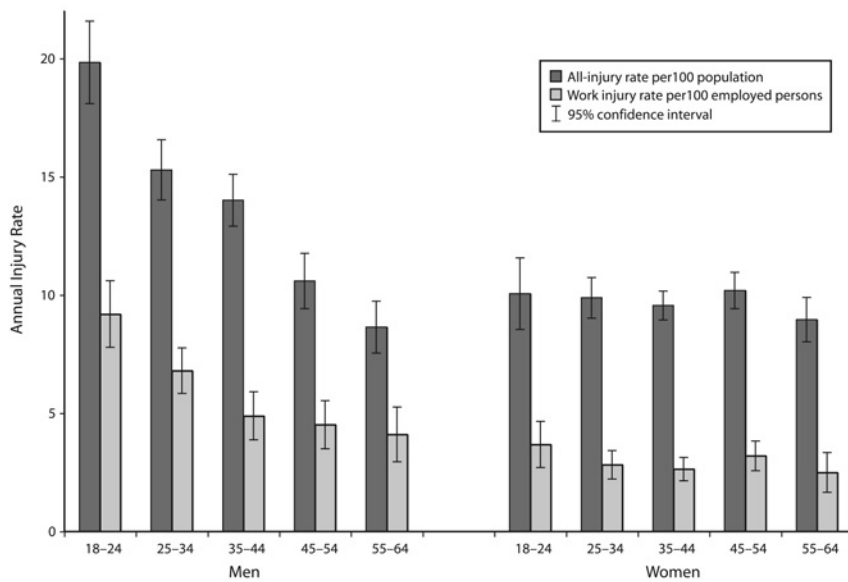


FIGURE 1—Annual rates of total injuries and work-related injuries by gender and age: National Health Interview Survey, 1997–1999.

Proportion of All Injuries That Were Work Related

Among all working-age persons, 28.6% of injuries occurred while people were working (Table 2). Annually, the employed population sustained 14.8 million injuries (data not shown), of which 37.5% occurred at work (Table 2). Among all working-age men, 34.5% of injury episodes occurred at work, compared with only 20.5% of such episodes among working-age women, with higher proportions among employed people, 42.3% and 29.7%, respectively. When data were stratified by the age of the injured person, the percentage of episodes that were work related ranged between 22% and 32%; when data were limited to employed persons, the figure was between 33% and 41%. When data were stratified by age and gender, the proportion of injuries that were work related was consistently higher for employed men than for employed women.

Nature of Injury and Body Region

For both work-related and non-work-related nonfatal injuries, sprains and strains were most common, followed by open wounds and fractures (Table 3). Crushing injuries, the presence of foreign bodies in an organ or body cavity, amputations, and burns

accounted for the highest percentages of work-related injuries. Only 17% of fractures and 18% of superficial injuries were work related. Overall, 11.3% of injury episodes (9.9% of work-related injuries and 11.8% of non-work-related injuries) were coded as *nature unspecified* (denoting that the respondent provided insufficient description of the injury to enable assignment of an *International Classification of Diseases, Ninth Revision, Clinical Modification [ICD-9-CM]*³² medical diagnosis code).

The upper- and lower-body extremities accounted for more than 60% of work-related and non-work-related injuries (Table 3). The upper extremities were involved in the largest percentage of work-related injuries, whereas for non-work-related injuries, the regions most affected were the lower extremities. Over a third of the upper-extremity injuries (36%) were work related, compared with less than a quarter of the lower-extremity injuries (23%). Fractures occurring at work were also more likely to affect an upper extremity, and non-work-related fractures were more likely to affect a lower extremity (data not shown).

Time Lost From Work

Among working-age adults, an estimated annual 8.9 million injury episodes and an esti-

mated 3.6 million work-related injury episodes resulted in at least part of a day off work. Of all injury episodes among the working-age population, 46.1% resulted in loss of at least part of a day of work, and 38.1% involved loss of 1 or more days (1–5 days lost, 21.6%; 6 or more days lost, 16.5%). Of all work-related injury episodes, 65.6% resulted in at least part of a day of lost work, and 51.0% involved loss of 1 or more days (1–5 days lost, 27.5%; 6 or more days lost, 23.6%) (data not shown).

To compare NHIS data with data from Bureau of Labor Statistics (BLS) surveys,^{6,7,15–17} which cover only private industry, we conducted separate analyses of the NHIS sample adult file; industry data were gathered only from the sampled adults. On the basis of the data from the sample adult file, 50.4% of the work-related injury episodes resulted in 1 or more days off work. Of the estimated 3.01 million annual occupational injuries resulting in at least 1 day off work reported by sample adults, 2.36 million (78.4%) were reported by employees in private industry; the remainder were reported by government employees, farm workers, or the self-employed (not included in BLS surveys).

DISCUSSION

Nonfatal injuries to working-age adults are common, annually resulting in 12 episodes of medically treated injuries per 100 adults aged 18 to 64 years. The redesigned NHIS enabled us to determine that work-related injuries are also common (4.5 episodes per 100 employed working-age persons) and are a significant part of the total injury burden; such injuries accounted for almost 30% of injuries to working-age adults, a figure that rose to almost 50% for 1 employed age group. Our ability to assess each injury recorded in the NHIS for work relatedness overcomes many of the shortcomings inherent in estimates of work-related injuries from other sources. Comparable data sources containing information on both work-related and non-work-related injuries have not been available; this lack of information has prevented an examination of the contribution of work-related injuries to the total injury burden.

TABLE 2—Percentage of Injuries That Are Work Related Among Working-Age Adults (Aged 18–64 Years), by Age, Race/Ethnicity, and Gender: National Health Interview Survey, 1997–1999

	Work-Related Injuries, %	
	Whole Working-Age Population ^a (95% CI)	Employed Working-Age Population ^b (95% CI)
Age, y		
18–24	28.6 (25.5, 31.7)	41.2 (36.8, 45.6)
25–34	32.1 (29.2, 35.0)	38.9 (35.4, 42.4)
35–44	27.0 (24.5, 29.5)	33.4 (30.4, 36.4)
45–54	29.9 (26.6, 33.2)	37.9(33.8, 42.0)
55–64	21.7 (17.8, 25.6)	38.0 (31.7, 44.3)
Gender and age		
Male	34.5 (32.5, 36.5)	42.3 (40.0, 44.6)
18–24	31.7 (27.6, 35.8)	44.6 (39.0, 50.1)
25–34	39.9 (36.0, 43.8)	43.8 (39.5, 48.1)
35–44	31.4 (28.1, 34.7)	37.1 (33.0, 41.1)
45–54	37.0 (32.3, 41.7)	43.4 (37.8, 49.0)
55–64	30.9 (24.4, 37.4)	49.2 (39.6, 58.7)
Female	20.5 (18.5, 22.5)	29.7 (27.1, 32.3)
18–24	22.4 (17.3, 27.5)	34.0 (26.5, 41.5)
25–34	20.6 (16.9, 24.3)	29.4 (24.1, 34.7)
35–44	20.6 (17.3, 23.9)	27.5 (23.2, 31.8)
45–54	22.9 (18.6, 27.2)	31.5 (25.6, 37.3)
55–64	13.7 (9.4, 18.0)	26.2 (18.3, 34.1)
Race/ethnicity		
White non-Hispanic	28.7 (27.1, 30.3)	36.9 (35.0, 38.8)
Black non-Hispanic	26.7(22.2, 31.2)	39.8 (33.2, 46.4)
Hispanic	33.8 (30.1, 37.5)	45.1 (40.2, 50.0)
Other non-Hispanic	20.8 (14.5, 27.1)	27.9 (19.8, 36.0)
Total	28.6 (27.2, 30.0)	37.5 (35.7, 39.3)

^aEveryone in the population aged 18–64 years regardless of employment status (n = 165 million).

^bPeople who were reported to be employed at a job or business in the week before the interview (n = 124 million).

Work-related injuries are often regarded as very different from non-work-related injuries in terms of etiology, surveillance, and prevention.¹² For instance, separate workplace-based data sources, such as BLS surveys or worker's compensation data, are used to study injuries at work.^{6,7,15–17} These sources are vulnerable to a variety of underreporting effects.^{5–7,9,10,18,19} For example, the BLS Survey of Occupational Injuries and Illnesses is the primary source of national nonfatal work-related injury data, but it covers only private industry. It excludes self-employed persons, government workers, and most workers on farms and in the informal workforce (e.g., domestic help, undocumented immigrants).^{15,16} In our study, 21.6%

of all injuries occurred among workers not covered by the BLS survey. Direct comparisons of our study with data from the BLS are possible only for cases involving lost work days, because these 2 data sources use different definitions of injury. Our NHIS-based estimate of occupational injury episodes occurring in US private industry that result in 1 or more days off work (2.36 million) was 1.4 times higher than the BLS's 1998 estimate of 1.649 million injuries that result in 1 or more days off work (i.e., excluding cases involving only restricted-duty days).¹⁶ This estimate confirms findings of previous studies that documented underreporting among the industry groups covered by the BLS.^{3–23} In addition,

the total NHIS work-related injury count for the United States (3.01 million) was 1.8 times higher than the BLS. This ratio is a function of both incomplete coverage of the US workforce by the BLS and underreporting of work-related injuries in the BLS.

Other population-based sources of occupational-injury data rely heavily on the recording of work relatedness in the medical record and may examine only 1 level of medical care. Surveys of occupational injuries with emergency department records, for example,^{5,33–35} exclude medical care provided in private physician offices and occupational health clinics. One 1988 study found that only 34% of all occupational injuries were treated in emergency departments.¹³ The reporting of work relatedness in clinical record systems is also known to be inconsistent.^{5,36} Many data sources, such as hospital discharge databases, do not systematically record work relatedness. Health care providers can play an important role in improving these data sources for occupational injury surveillance by documenting work relatedness in medical charts.

It is important to determine the work relatedness of all injuries to adults, because the type of injury usually provides little indication of whether it occurred at work. The characteristics of work-related and non-work-related injuries are similar, with little variation in distribution (Table 3). Although crushing injuries, the presence of foreign bodies, and amputations are more likely to occur at work, many such episodes occur in non-work settings. Documenting and reporting work relatedness is just as important for injuries as it is for occupational diseases.³⁷ Everyone involved in treating and preventing injuries should also evaluate work hazards, because many of the injuries occur at work, especially among working-age men.

Several earlier studies used NHIS data to examine injuries but did not compare all injuries with those occurring on the job. Warner and colleagues¹ reported that during the first year of the revised NHIS, 53% of injuries to all age groups occurred among adults aged 22 to 64 years, but they provided limited data on occupational injuries. Two recent studies examined sports and recreation injuries but did not consider whether any of these may have

TABLE 3—Nature of Injury and Affected Body Region in Work-Related and Non-Work-Related Injuries Among the Working-Age Population (Aged 18–64 Years): National Health Interview Survey, 1997–1999

	Work-Related Injuries Annually, No. in 1000s (%)	Non-Work-Related Injuries Annually, No. in 1000s (%)	% of All Injuries That Were Work Related (95% CI)
Nature of injury			
Sprains and strains	1892 (34.3)	4536 (32.8)	29.4 (26.9, 31.9)
Open wounds	1170 (21.2)	2354 (17.0)	33.2 (29.9, 36.5)
Fractures	498 (9.0)	2393 (17.3)	17.2 (14.3, 20.1)
Contusions	360 (6.5)	1197 (8.6)	23.1 (18.6, 27.6)
Dislocations	270 (4.9)	485 (3.5)	35.7 (28.4, 43.0)
Injury to internal organs	120 (2.2)	354 (2.6)	25.3 (16.5, 34.1)
Burns	183 (3.3)	251 (1.8)	42.1 (31.7, 52.5)
Superficial injuries	62 (1.1)	277 (2.0)	18.3 (9.9, 26.7)
Foreign bodies	164 (3.0)	97 (0.7)	62.9 (49.6, 76.2)
Crushing injuries	138 (2.5)	77 (0.6)	64.2 (50.1, 78.3)
Nerves	50 (0.9)	91 (0.7)	35.6 (20.5, 50.7)
Amputation of limbs	57 (1.0)	43 (0.3)	56.9 (37.5, 76.3)
Other specified ^a	... ^b (... ^b)	61 (0.4)	35.9 (15.9, 55.9)
Unspecified	548 (9.9)	1632 (11.8)	25.1 (21.2, 29.0)
Body region			
Lower extremity	1401 (25.3)	4716 (34.1)	22.9 (20.7, 25.1)
Upper extremity	2036 (36.7)	3641 (26.3)	35.9 (33.4, 38.4)
Spine and back	949 (17.1)	2140 (15.5)	30.7 (27.4, 34.0)
Face and neck	307 (5.5)	955 (6.9)	24.3 (19.4, 29.2)
Skull and brain	154 (2.8)	455 (3.3)	25.3 (17.9, 32.7)
Thorax	71 (1.3)	499 (3.6)	12.5 (7.0, 18.0)
Abdomen and pelvis	... ^b (... ^b)	54 (0.4)	38.3 (16.3, 60.3)
Other body regions	430 (7.8)	1291 (9.3)	25.0 (20.5, 29.5)
Total	5546 (100.0)	13 847 (100.0)	28.6 (27.2, 30.0)

^a“Other specified” includes injuries to blood vessels, toxic effects, external causes, late effects of injuries, early complications of trauma, and medical/surgical complications.

^bEstimates are unreliable, with relative standard error of the estimate greater than 30%.

been work related.^{30,38} Prior to revision of the NHIS, most analyses considered only broad classes of injury based on 4 combinations of place and activity (i.e., home, motor vehicle, work, and other place), but these classes were not mutually exclusive.

The revised NHIS now collects data on both cause and place of injury.^{1,39} One study that used NHIS data from 1983–1987 reported higher rates of occupational injuries than in our study, as did the BLS for that period (BLS rates declined in subsequent years).¹⁶ Comparisons with NHIS data from before 1997 are not valid because of the different survey instruments used.^{40,41} Other studies have used special annual supplements to the NHIS to examine the effects of disabil-

ity and impairment in the workplace.^{27,42,43} The 1988 Occupational Health Supplement to the NHIS included questions on work-related injury, but lack of detail on the injuries, small sample size, and problems associated with using a 1-year recall period restricted the supplement's utility in the study of workplace injuries.^{44,45}

Study Limitations

Any study relying on data from respondents may suffer from recall bias, which can result in underestimation or overestimation of injury rates.^{44,46–49} A 3-month recall period was used to increase the number of episodes of injury reported in our study.¹ Because recall improves as injury severity increases, we

enhanced recall accuracy by defining injuries as those that were severe enough to require medical attention.⁴⁷ It is possible that, in our study, home injuries were better recalled than work-related injuries because the interview took place in the home. However, we found no studies documenting such an “interview context” effect.

However, the NHIS definition of injury requires that medical attention be sought, and people injured at work may be more likely to seek medical attention than people injured at home for such reasons as improved access, compensation, and legal liability. This definition could result in the reporting of more work-related injuries than home injuries, but we were not able to address this issue in our study. Similarly, differences among recent immigrants in access to care or immigrants' reluctance to identify an injury as work related may also explain some of the observed variation by race/ethnicity. Other studies have in fact found higher rates of occupational injuries among Hispanics and Blacks, but studies across a broad range of industries have been restricted to evaluation of fatalities.^{50,51} A detailed examination of racial/ethnic differences would require careful adjustment for factors such as differences in occupational exposures and employment patterns.

Poisonings were excluded from our analyses because the activity question (asking what the person was doing when the injury occurred), which we used to define work relatedness, was not asked of those who had been poisoned until 2000. Poisonings account for less than 0.6% of all occupational injuries (from national emergency department visit data⁵²), and their exclusion is thus unlikely to have significantly altered our study findings. Owing to other questionnaire wording and survey design modifications, we did not combine the 1997–1999 estimates with more recent estimates because of concerns about comparability.⁴¹ The activity question used to define work relatedness allowed up to 2 responses. For instance, a respondent could choose “working for a paid job” and “driving or riding in a motor vehicle” as the activity being engaged in when the injury occurred. However, very few injury episodes had more than 1 activity listed, which may have resulted in underrepresentation of work relat-

edness, especially for motor vehicle injuries. Information on employment, including occupation and industry, was asked only of the sample adult, limiting our ability to conduct detailed comparisons by occupation and industry. Asking direct questions about work relatedness (e.g., whether the injury occurred during the course of paid work, or in what industry and at what occupation the injured person was working) would help to reduce the limitations of many health data systems.

Conclusions

Injuries to adults are an important public health problem that affects not only the person sustaining the injury but also other household members dependent on the injured adult for support. Injuries on the job are a significant part of this injury burden, comprising almost 30% of all medically treated injuries to adults aged 18 to 64 years. For employed men, 42% of all injuries were work related (49% among men aged 54–64 years). The NHIS is an important new source of data with which to determine the work relatedness of injuries and confirms previous studies in documenting serious underreporting by traditional workplace-based reporting systems.^{3–11} Population-based data, such as those obtained from the NHIS, provide a model for improving occupational injury surveillance and support proposals for community-oriented approaches that look at work-related and non-work-related injuries together.^{20–22} The fact that such a large proportion of injuries to working-age adults are occupational in nature also reinforces the need to examine workplace conditions in efforts to reduce the impact of injuries on society. ■

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Contributors

G.S. Smith conceived the study, supervised all aspects of its implementation, and led the writing of the article. H.M. Wellman conducted the analyses, and M. Warner assisted in calculating sample variances. All authors helped to conceptualize ideas, interpret findings, and review and revise drafts of the article.

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Human Participant Protection

The Liberty Mutual Research Institute for Safety institutional review committee for the protection of human subjects approved the study.

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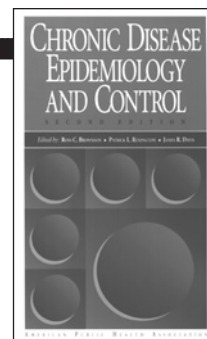
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