



Another look at the link between work injuries and job experience

FRED SISKIND

In a recent article in the *Review*, Norman Root and Michael Hofer investigated the relationship between duration of employment and worker injuries and illnesses.¹ Their analysis of 1976 and 1977 workers' compensation data for 10 States from the Bureau's Supplementary Data System (SDS) led them to conclude that "more workers are injured in the first month and year of service than any other month or year . . ."²

However, Root and Hofer were unable to calculate injury incidence rates by employment duration to determine whether certain tenure groups experience disproportionately high numbers of injuries. Constructing such statistics would involve dividing the number of injuries by the total exposed population for each group. While the numerators for incidence rates—numbers of injuries by employment duration—are available from the SDS, the appropriate denominators—total numbers of injured and uninjured workers by tenure group—are more difficult to estimate.

The following analysis uses a ratio index approach to gauge the relative injury experience of workers by duration of employment.³ Injury and employment duration information from the SDS is linked with work experience data for the general working population from the 1977 Quality of Employment Survey and the January 1978 Current Population Survey. As we will see, the results suggest that workers would generally be subject to disproportionately high injury rates during their first few months and years on the job.

Data sources

The *Supplementary Data System* gathers detailed injury and illness information from the workers' compensation system in each cooperating State⁴ Data from 1977

and 1978 are used for this analysis. The 1977 information covers 540,000 cases in the 12 jurisdictions which reported employment duration information to the Bureau for that year: California, Colorado, Idaho, Indiana, Iowa, Kentucky, Maine, Maryland, New Mexico, South Dakota, the Virgin Islands, and Wyoming. Data for 1978 pertain to 705,440 injury and illness cases from 16 jurisdictions—Alaska, Hawaii, Montana, and Utah, in addition to those listed above.

Records of injuries and illnesses in such a small number of jurisdictions are not necessarily representative of nationwide experience. However, the 1977 data are from jurisdictions accounting for 21 percent of U.S. employment, and 1978 information covers 23 percent.

The 1977 *Quality of Employment Survey* (QES) was conducted by the Survey Research Center of the University of Michigan under contract to the Department of Labor. During October-December 1977, a representative sample of 1,515 employed persons age 16 or older and currently employed 20 hours or more per week were interviewed concerning their work experiences. Two questions were asked regarding job tenure:

- "For how many years or months altogether have you worked for your present employer?"
- "For about how long altogether have you had your present job (with this employer)?"

Table 1. Relative injury experience by duration of employment, 1977

Employment duration	Percent distribution of			Incidence ratio 1 (1)/(2)	Incidence ratio 2 (1)/(3)
	Injury and illness cases ¹ (1)	Wage and salary workers ² (2)	All workers ³		
1 to 3 months . . .	20.8	11.3	14.0	1.84	1.49
4 to 12 months . . .	22.9	16.0	18.1	1.43	1.27
2 to 3 years . . .	20.4	19.6	21.8	1.04	.94
4 to 5 years . . .	11.0	11.1	12.0	.99	.92
6 to 10 years . . .	12.8	16.8	15.8	.76	.81
11 or more years	12.0	25.1	18.2	.48	.66

¹ Data are from unpublished SDS tables for 12 jurisdictions, and relate to workers age 16 and over by duration of employment.

² Data are from the 1977 *Quality of Employment Survey* (Ann Arbor, Mich., The University of Michigan, 1979), table 9.3. They relate to workers age 16 and over by duration of employment with present employer.

³ Data are from the 1977 *Quality of Employment Survey*, table 9.5, and relate to workers age 16 and over by duration of employment in present job.

Fred Siskind is a labor economist in the Office of the Assistant Secretary for Policy, Evaluation and Research, U.S. Department of Labor.

Table 2. Relative injury experience by duration of employment, 1978

Employment duration	Percent distribution of		Incidence ratio (1)/(2)
	Injury and illness cases ¹ (1)	All workers ² (2)	
1 to 3 months	20.1	11.6	1.73
4 to 6 months	10.6	9.0	1.18
7 to 12 months	14.4	9.8	1.47
2 to 3 years	20.9	20.7	1.01
4 to 5 years	9.9	12.3	.80
6 to 10 years	12.5	15.7	.80
11 to 25 years	9.9	16.0	.61
25 to 35 years	1.4	3.9	.36
36 or more years	.2	1.1	.18

¹ Data are from unpublished SDS tables for 16 jurisdictions, and relate to workers age 16 and over.

² Data are from unpublished tables for the January 1978 CPS, and relate to all workers age 16 and over, and cover the same jurisdictions except the Virgin Islands.

The first question was asked of wage and salary workers. The second was asked of all workers, with the phrase in parentheses omitted for the self-employed.⁵

The *Current Population Survey* (CPS) is a monthly survey of 65,000 households which provides comprehensive labor force data. A supplement to the January 1978 CPS asked respondents for 56,000 households to specify the date on which each employed household member started working at his or her present job or business. Duration data calculated from the responses to that question, and a description of the sample design and estimating methods, have been published in a BLS Special Labor Force Report.⁶

Results of the ratio index analysis

Table 1 presents the percentage distribution of injury and illness cases by duration of employment from 1977

SDS data (column 1), and the distribution of workers by duration of employment from the QES survey (column 2 in terms of duration with current employer, and column 3 by duration in current job). Columns 4 and 5 present the ratios of the injury and illness percentages in column 1 to the overall employment duration percentages in columns 2 and 3, respectively. A ratio greater than 1 indicates that the percentage of injuries for workers in the particular duration group (for example, 1 to 3 months) is higher than the percentage of employment accounted for by the same group. A ratio below 1 indicates the opposite.

Whether employment duration is measured as time with present employer or time in current job, the data show a steady decline in risk as employment duration increases. First-year workers incur more than their share of injuries while those with more than 5 years on the job experience a disproportionately low number of injuries. But while the results support our expectations, they are limited in scope and should be interpreted with caution. The injury and work duration data from the SDS cover only 12 jurisdictions in 1977 and 16 jurisdictions in 1978, while the employment duration data from the QES reflect nationwide experience. And, QES data do not permit analysis of injury experience for different age and sex groups.

The limitations listed above can be overcome by using employment duration data from the CPS. These data are based on a much larger sample than the QES results, and are available for the separate jurisdictions (except the Virgin Islands). Table 2 thus provides information, comparable to that in table 1, which is limited to the jurisdictions which submitted injury data for 1978 to

Table 3. Relative injury experience by employment duration, sex, and age, 1978

Sex and age of worker	Employment duration								
	1 to 3 months	4 to 6 months	7 to 12 months	2 to 3 years	4 to 5 years	6 to 10 years	11 to 25 years	26 to 35 years	36 years and over
Men									
Total, age 16 and over	2.02	1.33	1.63	1.09	.80	.76	.53	.30	.13
Age 16 to 17	1.69	.72	.95	.55	.30	...	...	...	...
Age 18 to 19	1.60	.83	1.02	.60	.24	...	...	...	...
Age 20 to 24	1.48	.97	1.32	.85	.64	.35	...	...	...
Age 25 to 34	1.76	1.27	1.51	.94	.73	.77	.49	...	...
Age 35 to 44	2.25	1.58	1.67	1.03	.85	.81	.67	.33	...
Age 45 to 54	2.19	1.59	1.84	1.36	1.13	1.10	.72	.53	.29
Age 55 to 64	2.34	1.29	1.40	1.43	1.10	1.08	1.09	.52	.36
Age 65 and over	2.91	1.55	2.35	1.65	.72	2.02	.99	.33	.12
Women									
Total, age 16 and over	1.33	1.00	1.30	.96	.86	.90	.80	.53	.25
Age 16 to 17	1.59	.71	.98	.68	.10	...	...	...	...
Age 18 to 19	1.53	.76	1.08	.64	.19	...	...	...	...
Age 20 to 24	1.36	.98	1.17	.82	.74	.53	...	...	...
Age 25 to 34	1.27	1.03	1.45	.92	.75	.91	.62	...	...
Age 35 to 44	1.23	1.13	1.22	1.08	1.02	.89	.76	.13	...
Age 45 to 54	.99	1.00	.98	1.69	1.02	.97	.81	.49	.33
Age 55 to 64	1.23	1.17	1.27	1.06	1.07	.91	1.01	.78	.43
Age 65 and over	.72	1.33	.96	1.34	.75	1.60	1.23	.50	.14

NOTE: Numerators for the ratios are data from unpublished SDS tables for 16 jurisdictions. Denominators are unpublished CPS data for January 1978 for the same jurisdictions, except the Virgin Islands.

the SDS. The ratio calculation results are generally similar to those shown in table 1. First-year workers experience more than their share of injuries while those with 4 or more years on the job incur a disproportionately low number of injuries. However, the decline in injury experience as job duration increases is not as smooth as that shown in table 1; for example, the 4-to-6-month ratio is below that for 7- to 12-months' tenure.

Table 3 presents ratios for detailed age categories by sex. Within most age categories, workers are more likely to experience an injury during their first few months or years on the job than after longer periods. However, for a few age groups—women 45 to 54, and both men and women 65 and over—a clear decline with tenure does not seem to prevail. Another interesting finding is that the disproportionately higher share of injuries experienced in the first 3 months, and generally the first year, in a new job is more marked for men than for women, particularly in the higher age categories. One possible explanation for this finding is the different industry and

occupational mix for men and women. Men may work disproportionately in those industries and occupations where injuries are more common in the first few months on the job.⁷

THE FOREGOING ANALYSIS indicates that workers would generally experience disproportionately high injury rates during their first year on a new job or working for a new employer. The data for men and women by detailed age categories support this observation. Almost all age and sex groups have disproportionately high injury experiences during their first few months and first full year on a new job.

These findings are further evidence that special efforts should be made to assure that new employees and employees changing jobs are aware of good safety practices in the workplace. The Federal Mine Safety and Health Amendments Act of 1977 requires such safety training for miners. Similar efforts may be beneficial in many other industries. □

— FOOTNOTES —

¹ Norman Root and Michael Hofer, "The first work-injury data available from new BLS study," *Monthly Labor Review*, January 1979, pp. 76-80.

Other published studies of the relationship between work injuries and work experience appear to be limited to specific industries, firms, or occupations, and most were conducted many years ago. See, for example, R. H. Van Zelst's study of copper plant workers, "Effect of Age and Experience on Accident Rates," *Journal of Applied Psychology*, October 1954, pp. 313-17; Amy Hewes, "Study of Accident Records in a Textile Mill," *Journal of Industrial Hygiene*, October 1921, pp. 187-95; Homer L. Humke's study of accidents in an industrial concern, "First Month Found Most Dangerous," *Personnel Journal*, March 1936, pp. 336-37; and Theodore Barry and Associates, "Behavioral Analysis of Workers and Job Hazards in the Roofing Industry," Contract No. HSM-99-72-121 for NIOSH, U.S. Department of Health, Education and Welfare, June 1975. Other studies are cited by Root and Hofer.

² Root and Hofer, "The first work-injury data," p. 77. Throughout

the following discussion, the word "injury" will include both injuries and illnesses.

³ See Norman Root and Deborah Sebastian, "BLS develops measure of job risk by occupation," *Monthly Labor Review*, October 1981, pp. 26-30, for a discussion of the ratio index technique applied to data for occupational groups.

⁴ A more detailed description of the SDS is provided by Norman Root and David McCaffrey, "Providing more information on work injury and illness," *Monthly Labor Review*, April 1978, pp. 16-21.

⁵ The QES is described in Robert P. Quinn and Graham L. Staines, *The 1977 Quality of Employment Survey* (Ann Arbor, Mich., The University of Michigan, 1979).

⁶ Edward S. Sekscenski, "Job Tenure Declines as Work Force Changes," *Special Labor Force Report 235* (Bureau of Labor Statistics, 1980).

⁷ Root and Hofer, "The first work injury data," p. 79. Tables 3 and 4 show considerable variance in injury experience by occupation and industry.