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Occupational safety and health: a report on worker perceptions

Hazardous working conditions erode job satisfaction, say increasing numbers of workers; especially threatened is the inexperienced employee, who is the most likely to be injured on the job but least willing to bring potential dangers to the attention of management

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In 1969, 1972, and most recently in 1977, the Institute for Social Research at the University of Michigan conducted opinion surveys of production workers, under U.S. Department of Labor sponsorship. These studies, known as the "Quality of Employment Surveys," gather data on numerous characteristics of the worker and his job, and perhaps most importantly, on the worker's subjective assessment of his worklife.¹ For the analyst, the surveys provide information about worker opinions and job satisfaction not readily available elsewhere. And, because many of the questions asked remain essentially unchanged from one survey to the next, the data may be used to chart major changes in attitudes toward various aspects of work over time.

Certain questions relate to job safety and health, or to workers' evaluation of safety as a job attribute. Under contract to the Department of Labor, the Center for Policy Alternatives at the Massachusetts Institute of Technology has examined data pertaining to a number of these safety- and health-related questions.² This article summarizes some salient results of that study.

Time trends in injury rates

Over the 8 years spanned by the Quality of Employ-

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ment Surveys, work-injury rates reported by the Bureau of Labor Statistics have fallen.³ Similarly, results from the Quality of Employment Surveys also indicate that the number of injuries clearly related to job activities, such as fractures and cuts, has declined. It is surprising then, that when asked generally about "work-related" injuries, survey respondents note a slight increase between 1969 and 1977.⁴ A detailed breakdown of the types of injuries reported by the workers suggests the cause of this apparent paradox: health problems of various kinds are increasingly perceived as due to workplace exposures. Because of the difficulty in proving the work-relatedness of many of these health problems, such "injuries" are not reflected in government statistics.

It is likely that the increase in perceived injuries results from greater worker sensitivity to a variety of occupational hazards. In 1977, 78 percent of those surveyed noted one or more safety and health hazards in the workplace, compared with only 38 percent in 1969. Respondents in the most recent study were asked to be more specific about the types of dangers they encountered on the job. Seventy-two percent of the men reported exposure to "fumes, dust, or other air pollution," as did 52 percent of the women. Similarly, 45 percent of the men and 21 percent of the women felt themselves exposed to "dangerous chemicals." Other significant workplace hazards, and the percentage of workers reporting each are shown below:

<i>Hazard</i>	<i>Men</i>	<i>Women</i>
Exposure to dangerous chemicals	45	21
Fire or electric shock	52	30
Fumes, dust or air pollution	72	52
Weather (outdoor)	52	10
Extremes of indoor temperature or humidity	35	47
Badly maintained or dirty workplace	37	26
Dangerously stored or misplaced items	24	13
Noise	45	54
Dangerous tools or equipment	55	37
Disease (contagious)	19	15
Traffic	38	13
Personal violence	21	11
Dangerous work methods	30	19
Other hazards	3	2

Another trend evident in the data is the increase in work-related injuries reported by women. Female production workers averaged over twice as many injuries in 1977 as in either 1972 or 1969, perhaps because by making inroads into traditionally male occupations, women are sharing the greater risks of these jobs as well.⁵

Job satisfaction and risk

In the 1977 Quality of Employment Survey, workers were also asked questions about their level of job satisfaction. Workers who reported exposure to a greater number of hazards, or who felt these hazards were more severe than average, were significantly less satisfied with their jobs.⁶ However, while it is tempting to infer that hazard exposure leads to lower job satisfaction, it is also possible that workers who were generally dissatisfied with their jobs for other reasons noted a greater number of hazards.⁷

Worker preference for safety and health

In 1977, respondents were asked to decide whether they would prefer a 10-percent pay raise or various other job improvements. Among these other improvements was "a little safer or healthier working conditions." By this "revealed preference" method, it was determined that nearly a third of all production workers would be willing to trade the pay increase for more safety and health at work. Other compensating benefits, and the fraction of production workers willing to trade a pay raise for each one:

<i>Benefit</i>	<i>Percent of workers</i>
Increased retirement benefits	65.9
More medical insurance	58.1
More paid vacation	57.5
Shorter workweek	42.4
Greater chance for promotion	40.6
Greater job security	33.7
A little more safety and health	33.1
Greater comfort at work	28.7
More interesting work	27.5
Greater freedom to decide work	18.2

While retirement benefits and medical insurance are universal concerns, occupational safety and health is likely to be important chiefly to those significantly at risk. Consequently, the figures above may underrepresent the willingness of hazard-exposed workers to forgo pay increases for safety improvements. For example, the 1977 data show that previously injured workers are more concerned about safety and health improvements than other groups. The same is true of union members, perhaps reflecting the greater unionization of risky jobs. And, workers who note workplace hazards, or who have specific health symptoms, are also generally more willing to sacrifice increased pay for a little more safety and health.

Working conditions and injury rates

A number of possible working conditions were introduced in the 1977 Quality of Employment Survey questionnaire. Workers were asked to decide which of these conditions were characteristic of their jobs. Thus, a worker could describe his job as being repetitious or interesting, or as requiring a high level of skill, or much physical effort.

Workers who noted "negative" working conditions also reported, on average, a greater number of job-related injuries. In particular, "fast" or "hard" work, and work requiring "considerable physical effort," were frequently associated with injuries. Workers who felt that they did not have enough authority, information, or assistance to do their jobs properly also had higher injury rates than other workers.

Many of these job characteristics were likewise related to the number of health symptoms reported by workers. These symptoms include such problems as "trouble breathing" or "back pains," and do not have to be work related. A larger number of symptoms seems to be associated with generally "negative" job qualities, while fewer symptoms are associated with "positive" job qualities:

<i>"Negative" job qualities</i>	<i>"Positive" job qualities</i>
Fast work pace	Need to learn new things fast
Work hard	Job allows freedom
Repetitious work	Job requires high skill level
Not enough help	Job has variety of work
Not enough authority	
Not enough facts and information	
Not enough tools and equipment	
Not enough time to do the job right	

These results suggest a causal relationship between work characteristics and health problems. Again, however, subjective bias may influence the results, as workers who are "generally dissatisfied" may tend to report

both more negative job characteristics and a greater number of health problems.

Tenure and perceived hazards

Other studies have found a significant relationship between a worker's tenure and the probability that he will have an accident.⁸ The survey data illustrate this relationship dramatically: workers employed between 1 and 3 months report 3 times as many injuries as workers with from 1 to 3 years on the job, and 8 times as many as those employed for more than 20 years.⁹

Perceived hazard exposure is also related to tenure. Workers who note badly maintained or dirty workplaces, or dangerously stored items, stay significantly shorter periods than other workers. Only perceived noise exposure does not seem to bear much relationship to tenure; workers who report exposure to noise do not have shorter average tenures than others.¹⁰

While workers who have been on the job for a relatively short time often note exposure to a greater number of hazards than other workers, they do not generally feel endangered. On the other hand, workers with longer tenures cite fewer hazards, but are more apt to judge them as "severe." It would seem from these results, and the data on injuries, that workers relatively new to the job may in fact be exposed to a greater number of hazards, but that they may underestimate the danger from these hazards.

Reporting of hazards by workers

When workers noted a hazard they felt to be "great" or "sizable," they were asked if they had "reported" it to anyone. The rate at which workers reported such dangers is influenced by a number of factors, the most important of which is tenure: fewer than 30 percent of employees with less than 3 months' tenure reported a severe hazard, compared with nearly 70 percent of those with between 5 and 10 years on the job. Union membership, age, and education were not significantly related to the hazard report rate. However, women, and employees who felt that their employers would not keep them fully informed about potential dangers were more likely than others to report a severe hazard.

When workers did report a hazardous condition to someone, 8 out of 10 did so to an immediate supervisor or other management personnel. Reports to a Government agency at any level constituted about 7 percent of all complaints, and reports to union representatives, less than 6 percent.¹¹

Priorities of union members

The 1977 Quality of Employment Survey provides considerable information about worker-perceived union performance in various areas of concern, including job safety and health. The following tabulation lists a num-

ber of possible areas of union activity, in the order in which workers feel effort should be expended. Thus, "handling grievances" is the area in which union workers want their unions to expend most effort, while "increasing worker input in business decisions" is the area in which they feel the least effort is needed:

<i>Area of union concern</i>	<i>Effort ranking</i>
Handling grievances	1
Keeping membership informed of union action	2
Improving fringe benefits	3
Increasing membership input in union direction	4
Increasing job security	5
Increasing wages	6
Increasing occupational safety and health	7
Increasing worker "say" in how the job is performed	8
Increasing job interest	9
Increasing worker input in business decisions	10

By and large, workers feel that their unions do pursue these goals in the correct order.¹² The greatest shortfalls between "desired effort" and "perceived performance" are in the areas of increasing membership input in union direction and handling of grievances. Monitoring of health and safety ranks seventh in shortfall of perceived union effort. However, it is noteworthy that union workers want almost as much effort spent on improving safety and health conditions as on increasing wages.

OSHA fines and survey data compared

The Occupational Safety and Health Administration (OSHA) collects data on inspection activity and fines as part of the Management Information System.¹³ By combining these data with those from the Quality of Employment Survey, it was possible to explore the relationship of worker-perceived hazards to the level of OSHA fines in any industry. Dollars of proposed penalty per hour of inspection time was chosen as a measure of the severity of safety violations noted by OSHA inspectors. This measure was assumed to be fairly independent of total industry employment.

OSHA's proposed penalty per hour of inspection time was higher in industries in which workers themselves noted the hazards of "noise," "dangerous work methods," "fire or shock," or "dangerous equipment." Worker perception of these dangers would thus seem to agree with the findings of OSHA inspectors.

OSHA fines did not vary significantly with the mean age of surveyed workers in an industry, or with their sex, race, income, or willingness to pay for health and safety. On the other hand, proposed penalties were highest for industries represented predominantly by

very small firms (those with under 10 employees) or very large firms (those with over 2,000 employees) on the Quality of Employment Surveys. While these differences are not large, they are unexpected, because medium-size firms have the highest reported injury rates.¹⁴

Conclusions

Information gathered in the Quality of Employment Surveys permits investigation of the relationship between various aspects of work, and worker satisfaction. The results of this study reveal that job safety and health are important concerns for most workers, and that such concerns are on the increase. While this conclusion should be encouraging to policymakers, certain problem areas in safety and health regulation were also identified.

The first of these involves the long recognized relationship between job tenure and injury probability. Stated simply, workers who are new on their jobs have several times the probability of injury of more experienced workers. At the same time, they are the least willing to report even severe perceived hazards to any-

one, probably because hazard reports must usually be directed to management. Finally, union handling of safety-related grievances is often felt to be inadequate by union members, and, consequently, few reports of dangerous conditions are directed through union channels. Mechanisms are needed to encourage new workers to report what they feel are severe hazards, and to provide all workers with alternatives when appeals to management fail.

The results of this study have implications for employers as well. Unpleasant working conditions generally, and injury-causing hazards in particular seem to go hand in hand. It is likely that a concerned management acts to alleviate unpleasant working conditions, including hazards. On the other hand, it is possible that workers who report hazards tend to note unpleasant work conditions because of their general job dissatisfaction. Further investigations are needed to help pinpoint the relationship between inadequate job safety and health and individual firm management styles. Such studies could also clarify the role of hazard abatement in improving employee morale. □

FOOTNOTES

Data are based on personal interviews with members of a national household probability sample of employed persons 16 years or older who worked for pay 20 hours a week or more. Thus, the term "workers" is defined to include adults substantially engaged in remunerative employment.

The 1969 survey included all eligible respondents in each of the sample households. During the 1973 and 1977 surveys, only one worker per household was interviewed, but responses were appropriately weighted to compensate for the underrepresentation of workers in multiple-worker families.

¹ U.S. Department of Labor, Contract J-9-F-8-0131, funded by the Office of the Assistant Secretary for Policy, Evaluation and Research. See Richard L. Frenkel and W. Curtiss Priest, *Health, Safety, and the Worker: An In-Depth Consideration of Hazards and Effects as Revealed in Survey Data* (Massachusetts Institute of Technology, Center for Policy Alternatives, September 1979) for a detailed full report on the study.

² The following injury and illness rates for manufacturing have been computed by the Bureau of Labor Statistics:

1969, 14.8; 1970, 15.2; 1972, 15.6; 1973, 15.3; 1974, 14.6; 1975, 13.0; 1976, 13.2.

Rates for 1969 and 1970 are frequency rates, and are not strictly comparable with figures for later years, which are incidence rates. Although these data indicate a modest decline in work-related illness and injury, it should also be noted that the lost workday case rate rose steadily over the same period.

³ Frenkel and Priest, *Health, Safety and the Worker*, p. 81. The following injury rates for production workers were computed:

Male	1969—.2177	1972—.2628	1977—.2882
Female	1969—.1212	1972—.1139	1977—.3179

These rates represent the total number of injuries experienced by workers in the 3 previous years, divided by the total number of workers. Thus, the annual injury rate equivalent may be computed by dividing by 3.

⁴ In 1969, the 100 female production workers reported 12 injuries, and in 1972, there were 13 injuries for 115 women. But in 1977, the 101 female production workers reported 32 injuries.

⁵ Significant at the 10 percent or better level.

⁶ Others have noted the problem of subjective bias. See Daniel Hamermesh, "Economic Aspects of Job Satisfaction," *Essays in Labor Market Analysis*, Orley Ashenfelter and Wallace Oates, eds., (New York, John Wiley & Sons, 1978).

⁷ See Nicholas A. Ashford, *Crisis in the Workplace: Occupational Disease and Injury* (Cambridge, Mass., The MIT Press, 1976), pp. 107-13, for a discussion of accident causation studies.

⁸ The rate for low-tenured workers is biased upwards because they may have changed jobs subsequent to, and because of, injury.

⁹ Corrected for age.

¹⁰ The figure is approximately 5.6 percent when limited to union workers, and lower, of course, when all workers are considered.

¹¹ See also "On Trial: A Union's Fairness," *Business Week*, Aug. 13, 1979, p. 76.

¹² We wish to express our appreciation to the Office of Management Data Systems of the Occupational Safety and Health Administration for providing these data in machine readable form.

¹³ The Quality of Employment Survey provided a convenient, but not very suitable, vehicle for investigating this relationship. The question is better suited to aggregate firm data. However, these results do contrast with the intent of the Schweiker Amendment to exempt establishments of 10 or fewer employees in selected SIC coded industries. The presumption in that amendment is that SIC coded industries with low injury rates should be exempted because their injury rates are low. However, this presumption ignores the possibility that although injury rates may be lower in some industries than others, the opportunity for improvement in reducing injuries and fatalities may be greater in some of the lower injury rate industries, especially if these industries are dominated by smaller firms.