

What Percentage of Workers With Work-Related Illnesses Receive Workers' Compensation Benefits?

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This study estimates the rate at which workers suffering from occupational illnesses file for workers' compensation lost wage benefits and identifies some of the factors that affect the probability that a worker with an occupational illness will file. A database of reports of known or suspected cases of occupational illness is matched with workers' compensation claims data. Overall, between 9% and 45% of reported workers file for benefits. Data limitations prevent a more precise estimate of this rate, but a large proportion of workers with occupational illnesses clearly does not utilize the worker's compensation system. Logit analysis of a choice-based sample shows that women and employees of small firms are more likely than others to file for workers' compensation and that filing rates vary considerably across industries and diagnostic categories. Acute conditions related to the current job are no more likely to lead to claims than chronic conditions with long latency periods between exposure and development of disease.

Workers' compensation laws were adopted on a state-by-state basis beginning in 1911, with employers being made liable for work-related injuries to employees regardless of fault. The intention was to provide quicker and more certain coverage of the monetary losses suffered by workers with job-related injuries, including medical costs and lost wages. To counterbalance the shift of liability to employers and the increased ease of obtaining compensation, the laws stipulated levels of compensation below what it was possible to obtain in the previous tort-based system. Over the years, the laws have been amended to cover occupational illnesses as well as job-related injuries.

In recent years, there has been concern about the rising premiums paid by employers for workers' compensation insurance and possible overuse of the system by workers. It is widely assumed in the business community and by many policy makers that there are a great many people who apply for workers' compensation benefits and do not deserve them but very few who are entitled to benefits but do not apply.¹ For example, *The New York Times* (December 29, 1991, p 1) quoted the chief executive of a large insurance company as saying that the system gave benefits to "anyone who asks" and described incidents of healthy workers being offered aid in getting workers' compensation benefits they did not need. Many economists have argued that the existence of easily

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obtainable workers' compensation benefits will not only induce workers to apply for them but will make workers more likely to miss work as a result of an injury, stay off work longer, exaggerate the severity of injuries, and even to act in ways that increase the risk of suffering an occupational illness or injury. Several studies have shown a positive relationship between the generosity of workers' compensation benefits in a state and both the number of reported workplace injuries and the amount of time lost due to injury.²⁻⁴

On the other hand, the public health community and many occupational medicine specialists are concerned with the possible underutilization of the workers' compensation system. There is substantial evidence that of all workers who develop chronic occupational illnesses with long latencies from the time of first exposure to the development of disease such as cancer or pneumoconiosis, only a small percentage actually apply for workers' compensation.⁵⁻⁹ It has generally been assumed that workers with acute conditions associated with their current jobs file at much higher rates, but little evidence has been presented in support of this assumption, in part because of the scarcity of data sets that allow the identification of individuals eligible for workers' compensation benefits who have not filed for benefits. Studies that have examined acute conditions have actually found that many workers with possibly work-related musculoskeletal conditions do not file.¹⁰⁻¹² For example, a study of employees of a Canadian aircraft engine factory reported that only 10% of workers who reported low back pain to an in-house occupational health facility reported lost work time to the worker's compensation bureau.^{11,12}

This study reports the results of analyzing whether approximately 30,000 workers in Michigan, all of whom were reported to the Michigan Department of Public Health as having known or suspected work-related

illnesses, filed for workers' compensation. The analysis is able to place upper and lower bounds on the percentage of workers with occupational diseases who file for workers' compensation. A multivariate analysis of the effect of type of injury and several worker and firm characteristics on the decision of a person with a work-related illness to file for workers' compensation benefits is also reported.

Data and Matching

In the state of Michigan, employers, hospitals, clinics, and physicians are required by law to report known or suspected "occupational diseases" to the Michigan Department of Consumer and Industry Affairs (Part 56 of Public Act of 1978; during the period covered by the sample, the reports were sent to the Michigan Department of Public Health). The law defines an occupational disease as "an illness of the human body arising out of and in the course of an individual's employment" including skin diseases, dust diseases of the lungs, respiratory conditions due to toxic agents, poisoning, disorders due to physical agents, or disorders associated with repeated trauma.

Although approximately 20,000 reports per year are currently being filed under the law, compliance is far from complete, and 90% of the reports are sent in by physicians working for major manufacturing firms. Because of the widespread noncompliance, a sample of the reports received by the state cannot be considered a random sample of all occupational illnesses occurring in Michigan. It does, however, allow the identification of a set of workers, all of whom, in the judgment of a health professional, have a known or suspected work-related illness. In addition to identifying the worker by Social Security number, each report includes information identifying the type of illness or injury, the date of diagnosis, the worker's sex and age, and the address of the employer. As the reports come in, this information

is reviewed and entered into an Occupational Disease Reports (ODR) database.

Using the ODR data base, we constructed a sample consisting of all individuals for whom a report had been filed in the years 1992, 1993, and 1994. If there were multiple reports on the same individual, the information on each was included. Then, using claims data obtained from the Michigan Bureau of Workers' Disability Compensation (BWDC), we attempted to determine which of the individuals in the ODR data had filed claims for workers' compensation wage-replacement benefits. BWDC claims data included a date of injury and, for 49.8% of the claims, a coding for type of injury or illness as well. Claims requesting only reimbursement of medical expenses were, unfortunately, not included in the BWDC data set. However, statistics suggest that payments of claims for medical benefits only are a relatively unimportant part of the total workers' compensation picture, representing less than 10% of total workers' compensation payments annually.¹³

If the BWDC data included a claim with the same Social Security number as that of an individual contained in the ODR data, the individual was said to have a "match." We searched the entire BWDC database, which recorded claims dating as far back as 1966. The older claims were included because if a condition for which a worker files a claim is a recurrence of a condition for which he or she earlier filed a claim, the second claim may be given the date of injury from the first claim filed as a result of that condition. If a Social Security number appearing in the ODR sample did not appear in the BWDC data, we could be sure that there was no match: the individual had filed no wage replacement claim for any of the conditions reported in the ODR data. If a Social Security number did appear in both data sets, but disease codes did not match or there was no disease code in the

BWDC data set, the situation was less clear. It was possible, for example, for an individual to have one condition reported in the ODR data but to have filed a claim for lost wages based on some other condition. Determining whether or not this was actually the case was made difficult by the fact that many of the claims in the BWDC data had incomplete data on the condition giving rise to the claim and by the uncertainty surrounding the claim dates in the BWDC data. Also, the BWDC and the ODR data use different systems for coding medical conditions, and the diagnosing physician filing a report may have coded only one condition when several were present.

In the face of this ambiguity, a person in the ODR data as was classified as possibly having a match if the individual's Social Security number appeared in the BWDC database. A person was classified as almost certainly having a match if their Social Security number appeared in both databases and they had at least one record in the BWDC data with an injury date within seven days of a diagnosis date reported for them in the ODR data; or if they had a BWDC report and an ODR report with diagnosis codes describing similar conditions and dates within one month of one another. Because "almost certain" matches are also classified as "possible" matches, the percentage of ODR sample members with possible matches and the percentage of ODR sample members with almost certain matches can be regarded as upper and lower bounds on the true probability that a person for whom an occupational disease report is filed with the state of Michigan will also file a lost workday claim for a reported condition.

Data Analysis and Results

Table 1 shows summary characteristics for the ODR data. The sample contains 29,558 individuals; approximately 42,000 reports were filed on these individuals (multiple reports

TABLE 1
Characteristics of Occupational Disease Reports (ODR) Data

Number of Individuals with Reports	29558
Percent Male	73%
Percent in Firms with >500 Employees	98%
Average Age	43.24

were filed for about 25% of the sample members). Seventy-three percent of the sample was male. Ages ranged from 17 to 70, with a mean of 43.2. All but 2% of the sample members worked for firms with more than 500 employees, reflecting the fact that physicians working for large manufacturing firms are most likely to be in compliance with the reporting law. Seventy percent of the people for whom reports were filed worked in the automobile industry.

Table 2 reports the percentage of people in the ODR sample with no match, a possible match, and an almost certain match in the BWDC data, both for the sample as a whole and for various subsamples. The first line of the table pertains to the sample as a whole and shows one of the central results of the article: at least 55% of the ODR sample members, workers reported by health professionals to have a known or suspected occupational illness, did not file with BWDC for wage replacement benefits. The other 45% may have filed for benefits; we can only be certain that 9% did. Females were more likely than males to be classified as possible matches and also as almost certain matches. No clear generalization concerning age and the propensity to file can be made based on Table 2. The last three lines of the table refer to subsamples of individuals reported for particular medical conditions. Sixty-two and a half percent of workers diagnosed with carpal tunnel syndrome were possible matches; 22.6% were certain matches. The corresponding percentages for those reported for work-

related sprains and strains were lower, at 46.9% and 11.6%. Of workers diagnosed with the long-latency occupational illnesses pneumoconiosis and asbestosis, 56.5% were classified as possible matches. The low percentage of pneumoconiosis/asbestosis cases classified as certain matches (.7%) may be due to the chronic nature of the conditions—more recent recurrences of the problem are more likely to be filed under the dates of the first claim in the BWDC data, and BWDC claims with less recent dates are more likely to be missing data on type of injury.

Comparisons such as these are of limited reliability for at least two reasons: first, because of the existence of the possible but not certain matches, and second because of the possibility that differences between groups in propensity to file are due to some factor other than membership in the group. For example, women may file at the same rate as men who have the same conditions, but may tend to be reported for more serious conditions, leading to an overall higher rate of filing among women. For that reason we conducted a multivariate logit analysis of the decision to file, with the unit of analysis being the individual worker.

Prior to conducting the logit analysis, the possible but not certain matches were excluded from the data set, allowing a comparison of the characteristics of reported workers who almost certainly did file for benefits to those of reported workers who certainly did not. This created a choice-based sample; that is, one chosen in a way that leads the proportion experiencing a certain outcome in a sample to differ substantially from the proportion experiencing that outcome in the population. In order to obtain consistent estimates of the parameters of a logit model explaining the outcome in a choice-based sample, it is necessary to weight the observations prior to estimation. Ideally, the weights are based on the true propor-

TABLE 3

Logit Model Comparing Reported Workers Who Did Not File to Those Who Almost Certainly Did*

Independent Variable	Coefficient (Odds Ratio)	95% Confidence Interval
Worker and Firm Characteristics		
Female	1.50	1.37–1.64
Fewer than 500 employees at firm	1.66	1.25–2.20
Age	1.10	1.06–1.13
Age squared	1.00	.998–.999
Diagnosis Categories†		
Carpal tunnel	3.09	2.47–3.86
Disorders of or foreign objects on eye	.17	.08–.38
Ear diseases	.03	.02–.06
Pneumoconiosis due to dust or sand	1.33	.94–1.90
Asbestosis	4.06	.13–129.97
Other respiratory problems	.29	.09–.96
Skin problems	.26	.19–.36
Arthropathies; rheumatism not including back	1.25	1.03–1.51
Dorsopathies	1.15	.89–1.49
Sprains and strains of arm	.86	.70–1.06
Sprains and strains of hand or wrist	.89	.73–1.10
Other sprains and strains	1.64	1.27–2.11
Burns; effects of heat, cold, or light	.21	.12–.37
Poisoning; toxic effects of substances	.32	.18–.60
Injuries (fractures, dislocations, contusions, open wounds, etc)	.79	.54–1.14
Industry Categories‡		
Chemicals	.95	.64–1.41
Rubber and plastics	1.30	.97–1.75
Primary metals	.53	.38–.74
Fabricated metal	1.31	1.11–1.56
Machinery, excluding electric	.58	.35–.98
Electric/electronic equipment	.95	.67–1.3
Motor vehicles and other transportation equipment	2.49	2.25–2.75
Other manufacturing	4.91	3.85–6.27
Hospitals and health services	3.13	1.84–5.33
Other non-manufacturing	.46	.21–1.00
Industry not reported	5.4	2.21–13.23

* Dependent variable equals 1 if claim was filed, zero otherwise; sample mean = .149; Sample Size = 18297.

† The excluded or comparison category includes mental disorders, ill-defined conditions and symptoms, and a collection of infrequently reported conditions.

‡ The excluded or comparison industry is Motor Vehicles Parts and Accessories.

individuals identified by a physician as having a work-related illness. However, there are numerous studies of how workers' compensation reciprocity or absenteeism vary with sex, age, and/or firm size, and they have some bearing on our logit results concerning worker characteristics.^{3,16–21} In these studies, the outcome variable is either an individual's decision to file for worker's compensation or to miss work, or the injury or claims rate of an establish-

ment. The variation in the outcome variable reflects both the variation in the probability of becoming sick or injured and in the probability of responding to that event by filing a claim or missing work. Our study, by contrast, attempts to explain variation in the claims rate conditional on having a known or suspected occupational illness.

Previous estimates of the effect of sex on both the likelihood of receiving workers' compensation benefits

and the likelihood of absenteeism from work has generated mixed results, with the direction and significance of the male/female difference varying across studies and even varying within studies depending on the sample or the list of control variables used.^{3,16–18} Two of three studies looking at the relationship between absenteeism and age find it to be positive and significant, and the explanation given is that older workers need more time for recuperation.^{16,18,20} Studies of injury rates and benefit reciprocity, however, have found these outcomes to decline with age.³ Only two of the studies include measures of firm size, with one finding that injury rates decline with firm size, and one finding that absenteeism increases with firm size for blue-collar workers.^{18,21} One explanation of our result of a smaller propensity to file in larger workplaces may be that workers at large firms are more likely to have access to medical and other income replacement benefits that can serve as an alternative to workers' compensation.¹⁰ However, it is possible that the significant coefficient on firm size in Table 3 results from the fact that although diagnosis category has been controlled for, the severity of a condition within a category is not. Reports on employees of smaller companies are typically received from non-company physicians, who report much less frequently than company physicians. If a non-company physician reports, it may be because the illness is more severe or simply because the physician is seeing the worker for a workers' compensation evaluation.

Coefficients of many of the diagnosis categories were statistically significant. Workers reported for carpal tunnel syndrome were most likely to file (OR = 3.09; CI, 2.47–3.86), followed by sprains and strains excluding the arm and wrist (OR = 1.64; CI, 1.27–2.11). Among the conditions least likely to generate a claim were chemical and heavy metal toxicity (OR = .32; 95% CI,

.18-.60). foreign objects in the eye (OR = .17; 95% CI, .08-.37), burns and other effects of heat (OR = .21; 95% CI, .12-.37), and hearing loss (OR = .03; 95% CI, .02-.05). While previous studies have reported that only a small percentage of workers who develop chronic occupational illnesses with long latency periods from the time of first exposure to the development of disease file for workers' compensation, this study found similarly low percentages of workers filing for acute conditions. Actually, in our sample, after controlling for age, gender, industry, and employer size, workers with pneumoconiosis were more likely to file than those in any other diagnosis categories, although this difference was not statistically significant (OR = 4.06; 95% CI, .12-129.97). Once again, this may be due to the fact that reports of pneumoconiosis are more likely to be received from non-company physicians on patients who are in the process of filing a workers' compensation claim.

Primary metals, machinery manufacturing, and nonmanufacturing industries are those in which a reported illness or injury was least likely to result in a claim for lost wages, other things equal. The industries in which workers were more likely to file are motor vehicles, health services, and miscellaneous manufacturing. Workers for whom no industry was reported are also much more likely to file. There is no obvious explanation of the pattern of propensity to file across industry. Particularly puzzling is the significant difference between the motor vehicles industry and the very similar motor vehicles parts and accessories industry.

As noted above, our major finding is that at least 55% percent of the members of our sample, and perhaps as many as 90%, did not file for wage-loss benefits. Why they did not remains to be explained. One possible reason for a failure to file on the part of a worker in our sample would be that his or her condition was not "compensable" under workers' com-

pensation law. This does not seem likely, given that to be included in our sample a worker must have been diagnosed by a health professional, in most cases one acting on behalf of the workers' employer, as having a known or suspected occupational disease. Furthermore, under workers' compensation, the threshold for compensability is a very broad one. Work-related activities need not be the primary cause or even the "cause" of a compensable disability. It is generally sufficient that work "caused, contributed to, or in some way aggravated" a condition.²²

The more likely reason for the failure of many of the workers in the ODR database to appear in the BWDC data base is that the latter data contains only claims for lost-wage benefits; claims for reimbursement of medical costs only are not included. In Michigan, one must be out of work for at least one full week to be eligible for lost-wage benefits; many of the workers reported to the Department of Public Health probably did not satisfy this criterion. This finding itself is significant, however. If, as some employers seem to believe, workers have a tendency to overuse workers' compensation benefits, one might expect to see a substantial portion of the people who have been identified by the company doctor as suffering from a work-related condition taking a week away from work. The evidence we have presented suggests that a significant number of employees with occupational diseases forego this option, instead choosing to "tough it out" or "work through" the problem that first brought them to the attention of the company physician. It also seems clear that worker's compensation claims data cannot be relied upon as an indicator of the prevalence of occupational illnesses.

We are currently in the process of interviewing a sample of 1600 workers reported with known or suspected occupational diseases. It is hoped that these interviews will lead to a better understanding of why some

workers with occupational disease file for workers' compensation and others do not.

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References

1. Hunt HA. Two rounds of workers' compensation reform in Michigan. In: Chelius J, ed. *Current Issues in Workers' Compensation*. Kalamazoo: WE Upjohn Institute for Employment Research; 1986.
2. Gardner JA. *Return to Work Incentives: Lessons for Policy Makers from Economic Studies*. Cambridge MA: Workers' Compensation Research Institute; 1989.
3. Krueger AB. Incentive effects of workers' compensation insurance. *J Public Econ*. 1990;41:73-99.
4. Viscusi WK, Moore MJ. *Compensation Mechanisms for Job Risks*. Princeton, NJ: Princeton University Press; 1990.
5. Barth P. Compensation for asbestos associated disease: a survey of asbestos insulation workers in the United States and Canada. In: Selikoff I, ed. *Disability Compensation for Asbestos Related Disease in the United States*. New York: Mt. Sinai School of Medicine; 1982: 213-291.
6. National Research Council. *Counting Injuries and Illnesses in the Workplace: Proposals for a Better System*. Washington DC: National Academy Press; 1988.
7. Roser:man KD, Reilly MJ, Kalinowski DJ, Watt FC. Silicosis in the 1990s. *Chest*. 1997;111:779-786.
8. Stanbury MS, Joyce P, Kipen H. Silicosis and workers' compensation in New Jersey. *J Occup Environ Med*. 1995;37: 1342-1347.
9. US Department of Labor. *An Interim Report to Congress on Occupational Diseases*. Washington, DC: US Department of Labor; 1980.
10. Park RM, Krebs JM, Mirer FE. Occupational disease surveillance using disability insurance at an automobile stamping and assembly complex. *J Occup Environ Med*. 1996;38:1111-1123.
11. Park RM, Nelson NA, Silverstein MA, Mirer FE. Use of medical insurance