

Hunt, H. Allan; Habeck, Rochelle V.

Working Paper

The Michigan Disability Prevention Study: Research Highlights

Upjohn Institute Working Paper, No. 93-18

Provided in Cooperation with:

W. E. Upjohn Institute for Employment Research, Kalamazoo, Mich.

Suggested Citation: Hunt, H. Allan; Habeck, Rochelle V. (1993) : The Michigan Disability Prevention Study: Research Highlights, Upjohn Institute Working Paper, No. 93-18, W.E. Upjohn Institute for Employment Research, Kalamazoo, MI, <https://doi.org/10.17848/wp93-18>

This Version is available at:

<https://hdl.handle.net/10419/172353>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

1993

The Michigan Disability Prevention Study: Research Highlights

H. Allan Hunt

W.E. Upjohn Institute, hunt@upjohn.org

Rochelle Virginia Habeck

Michigan State University

Upjohn Institute Working Paper No. 93-18

****Published Version****

In *Workers' Compensation Yearbook*, 1995. Horsham, PA: LRP Publications, 1994, pp. I-114 - I-123

Citation

Hunt, H. Allan, and Rochelle V. Habeck. 1993. "The Michigan Disability Prevention Study: Research Highlights." Upjohn Institute Working Paper No. 93-18. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research. <https://doi.org/10.17848/wp93-18>

This title is brought to you by the Upjohn Institute. For more information, please contact ir@upjohn.org.

**THE MICHIGAN DISABILITY PREVENTION STUDY
RESEARCH HIGHLIGHTS**

Upjohn Institute Staff Working Paper 93-18

H. ALLAN HUNT, Project Director
W.E. Upjohn Institute for Employment Research

ROCHELLE V. HABECK, Principal Investigator
Michigan State University

April 1993

With Grant Support From
Michigan Department of Labor
Safety Education and Training Division

W.E. Upjohn Institute for Employment Research
300 S. Westnedge Avenue
Kalamazoo MI 49007-4686
(616) 343-5541

THE MICHIGAN DISABILITY PREVENTION STUDY RESEARCH HIGHLIGHTS

Executive Summary

This 3-year collaborative research project was designed to provide empirical evidence to substantiate the impact of various employer policies and practices on the prevention and management of workplace disability. It studied a random sample of 220 Michigan establishments with more than 100 employees from seven different industries who responded to a mail survey in the first half of 1991. The study correlates differences in employer-reported levels of achievement on policy and practice dimensions with performance on disability outcome measures, while controlling for a set of establishment characteristics in a multivariate regression analysis.

There are three sets of policy and practice interventions evaluated here. First is safety intervention, that is, the attempt to prevent injuries from happening at all (measured as Safety Diligence, Ergonomic Solutions, and Safety Training). Second is disability management, the set of strategies to minimize the disability consequences of a given injury or disease arising from the workplace (measured as Disability Case Monitoring and Proactive Return-to-Work Program). Third is health promotion, which represents an attempt to intervene directly with individuals to encourage more healthy lifestyles, in the expectation that this will reduce the likelihood of a workplace accident or disease, or reduce the lost worktime resulting from a given injury or disease (measured as Wellness Orientation). In addition, a fourth dimension was included to capture the general environment of the firm and the orientation of its management in areas relevant to the study (measured as People Oriented Culture and Active Safety Leadership). These interventions and the general environment of the firm were scored on this set of eight variables which represent self-rated firm achievement of the policy and practice dimensions.

The marginal effect of these interventions is determined by comparing firm performance on the incidence of work-related disability (Lost Workday Cases and Workers' Compensation Wage-Loss Claims), the duration of disability (Lost Workdays per Case), and overall disability prevention and management performance (Total Lost Workdays). Our results show that a higher self-rating on Safety Diligence is strongly associated with better performance on disability outcomes, varying with the specific measure. Higher self-rating on Proactive Return-to-Work Programs is also strongly associated with better performance outcomes. Safety Training and Active Safety Leadership is shown to have significant effects on the number of Lost Workday Cases.

For example, on the summary measure of total Lost Workdays per 100 Employees, 10 percent better self-rating on Safety Diligence translates into 17 percent fewer lost workdays, and 10 percent better self-rating on Proactive Return-to-Work Programs translates into 7 percent fewer lost workdays. Thus, the twin strategies of trying to prevent injuries in the first place, and working to ameliorate their disability effects through disability management techniques, are both shown to be productive in reducing workplace disability in those establishments that have implemented them rigorously.

Disability Case Monitoring could not be shown to have significant effects; in fact, Disability Case Monitoring had negative impacts in some cases. This probably reflects the controlling aspects of Disability Case Monitoring, as we speculate that these practices can be viewed by the employees as negative and interfering if they do not emanate from a supportive company human resource climate. Ergonomic Solutions and Wellness Orientation generally do not perform significantly, and this is attributed to their indirect connection to the performance outcomes used here or ineffective measurement of these dimensions in the study.

Site visits were made to a subsample of 32 firms selected from the larger, random sample in order to confirm the quantitative survey findings and gain operational understanding of successful policies and practices contributing to low disability rates. Companies were generally found to be most advanced in their safety efforts, very active in injury management, and had implemented at least some form of return-to-work. Health promotion strategies to prevent specific work injuries have not yet been fully developed.

The disability prevention efforts of successful firms use data effectively to measure performance, identify problems, guide actions taken, and motivate active support and participation of management, supervisors and line employees. Successful firms rigorously investigate injuries and communicate their commitment by immediately responding to risks when they are identified. In these low-disability firms, safety and disability management are viewed as components of quality, productivity and financial stability. Working relationships have been developed with responsive health care providers to assure effective injury management, but firms also maintain an active role in case management themselves. Their return-to-work process is systematic, yet flexible to respond to individual needs. Innovative firms have also implemented ergonomic principles to prevent risks. Nearly all companies visited reported increasing incidence and costs due to cumulative trauma and repetitive motion disorders. Additional strategies are needed to resolve and prevent these disabilities.

This study demonstrates that many employers have moved aggressively to policies and practices designed to reduce the incidence and the costs of disability in their workplace. The project concludes that disability can be prevented and managed; and those who do it well can expect to be rewarded with lower disability costs, more satisfied workers, higher productivity and, ultimately, higher profits.

THE MICHIGAN DISABILITY PREVENTION STUDY RESEARCH HIGHLIGHTS

Introduction

Disability in the workplace has become a central concern for business and labor, as the economic and human costs continue to grow unchecked. The extensive personal losses associated with disability, the staggering consequences in health care and related expenditures, and the productivity losses associated with disability have gained increasing recognition as costs that affect all of us. Further, because of policy initiatives such as ADA, and significant demographic changes in the numbers and skill levels available in the labor force, companies today feel compelled to maintain the health and productive employment of their current workers and to accommodate workers who develop chronic impairments.

Clearly, the unacceptably high incidence of workplace injury and disability constitutes a major social problem. The Bureau of Labor Statistics, U.S. Department of Labor estimates that 7 in every 100 workers suffer a nonfatal work injury every year, or 6.2 million injured workers in 1988. These injuries resulted in 2.9 million lost workday cases, which include an average of 19 lost workdays per case, or 55 million total lost workdays (BLS, 1990). In 1989, nearly two million workers sustained injuries that resulted in disabilities. At that time, the cost of occupational injury was conservatively estimated at \$83 billion (Hensler, 1991). Burton (1992) projected that employers' direct costs of workers' compensation insurance alone passed the \$60 billion level in 1991. Chelius, Galvin, and Owens (1992) found that total disability costs comprised slightly more than 8 percent of payroll in a small nonrandom sample of firms they studied.

Further, the rate of increase in the cost of workers' compensation and other disability insurance programs has been astronomical. From 1980 to 1989, the last year for which figures are available, the average medical claim in workers' compensation rose from \$1,741 to \$5,370, while the average wage-loss claim increased from \$4,522 to \$10,735 (Thompson, November 1991). The incidence rate for occupational injuries and illnesses has also been on the rise since 1982, and thus far no one has offered a fully acceptable explanation. The number of workdays lost to occupational injury has been increasing steadily since 1982, resulting in over 92 lost workdays per 100 full-time workers in Michigan by 1988 (MIOSHA, 1990). Of course, these figures do not account in any way for the immeasurable personal consequences of pain, suffering, stress, and reduced quality of life for injured workers and their families.

In the face of these trends, it is apparent that the safety and accident prevention programs of the past are not sufficient to achieve disability cost containment today. It is necessary to go beyond safety and accident prevention methods to an integrated disability prevention and management approach, including accident prevention, injury management, claims management, and return-to-work techniques. The National Industrial Rehabilitation Corporation (1991) estimates that companies can reasonably expect a 25 to 30 percent cost reduction in workers' compensation costs after the first year of implementing a disability management program, and that

cost reductions can be nearly twice as great when long-term, relatively inactive cases are resolved.

Rousmaniere (1990) claims that roughly 50 percent of the costs that result from accidents depends on how the company responds to and manages injuries after they occur. This was confirmed in our previous study (Habeck, Leahy, Hunt, Chan and Welch, 1991), which found that a sample of poorly performing Michigan employers had twice as many MIOSHA recordable incidents, but four times as many workers' compensation claims as a sample of high performance employers. This implies that what happens after the injury may be as important as preventing the injury from occurring in the first place.

This research project, "Disability Prevention Among Michigan Employers," was designed to provide statistically valid and behaviorally reliable empirical evidence to show the impact of workplace policies and practices on the prevention and management of disability. The strategy adopted was to use a cross-section of firms to study the contributions of these policies and practices in explaining individual company accident and disability experience. Once these relationships are established, it is reasonable to infer that companies that adopt these injury prevention and disability management techniques should be able to improve their performance to match the performance of those companies already using these methods.

Methodology and Data

This report of research highlights is based upon a three-year project to verify and extend the results of the pilot study completed in 1988 (Habeck, Leahy, Hunt, 1988). That earlier study demonstrated that: (1) There was great variation in workers' compensation claim rates among Michigan firms. In fact, analysis of administrative data revealed at least a tenfold variation between the incidence of claims at the best and worst establishments in each of 29 industries reviewed. (2) The variation in claims incidence could only partially be explained by differences in industry, size, and location. In fact, only 25 percent of the variance could be explained by these three factors. (3) A nonrandom sample of high-claim firms had twice as many accidents, but four times as many workers' compensation claims as an equivalent nonrandom sample of low-claim firms. (4) There were a number of self-reported organizational policies and practices that correlated with low claim rates. Among these were an open managerial style and a corporate culture that displayed an obvious human resource orientation. In addition, low-claim firms reported that they more frequently engaged in safety and prevention activities than high-claim firms. They also more often reported employing procedures to prevent and manage disability after an accident had occurred.

The present project extends these findings in a number of ways. First, the empirical base was expanded to encompass seven industries, including six of the eight most hazardous industries

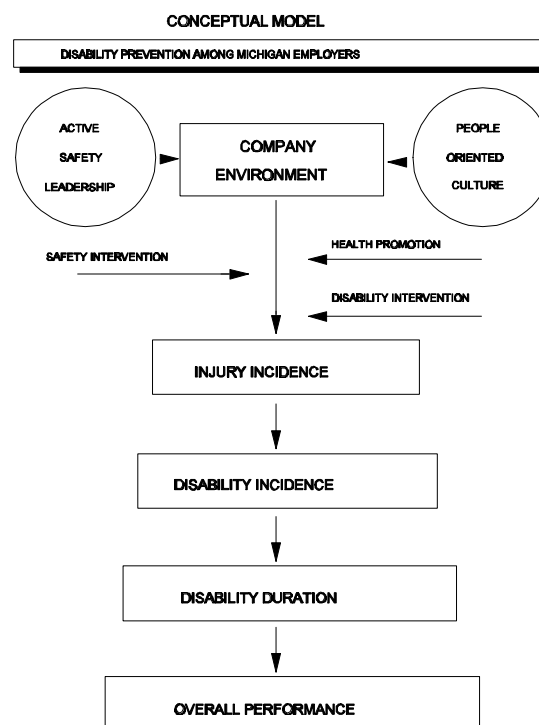
according to MIOSHA, plus the most hazardous of the service industries.¹ The study also extended the list of behaviorally observable variables through a redesign and expansion of the data collection instrument from the pilot study. It enlarged the survey sample from 124 to 220 establishments and substantially increased its analytical value by drawing a random sample from the seven target industries. It replicated the pilot study by analyzing administrative data as well as survey data, but it significantly extended the research design by including on-site visits to a subsample of 32 of the 220 surveyed firms. For reasons of budget constraint and feasible sample size, the study confined its attention to establishments with more than 100 employees. Thus the project studied establishments in three size categories, 100 to 249, 250 to 499, and over 500 employees, from each of the seven industry groupings.

Figure 1 shows the conceptual model that guided this project from its inception. General characteristics of the company environment (e.g., workforce make-up, size, unionization) are taken as given. Considered as major influences stemming from the managerial philosophy and leadership style of the company are the degree of orientation to people (people oriented culture) and the involvement of top management in safety and prevention efforts (active safety leadership).

In addition to these "managerial" factors, there are three general sets of policy and practice interventions studied here. First is safety intervention, that is, the attempt to prevent injuries from happening at all. This is the oldest and most established of the policy and practice areas studied for this project, and our empirical results show that it is still critically important to success.

Second is disability intervention, or disability management. This includes several techniques that are gaining more and more currency among business establishments today as effective strategies to minimize the disability consequences of injuries and diseases arising from the workplace. Third is health promotion, which represents an attempt to intervene directly with the individual to encourage more healthy lifestyles, in the expectation that this will reduce the likelihood of an injury or disease, or reduce the lost worktime resulting from

Figure 1



¹SIC 20, Food Production; SIC 25, Furniture Mfg; SIC 30, Rubber & Plastics; SIC 34, Fabricated Metals; SIC 35, Non-Electrical Machinery; SIC 37, Transportation Equipment; and SIC 80, Health Services.

a given injury or disease process. Any of these interventions could reduce the overall incidence of work-related disability; the question this study seeks to answer is "by how much?"

The impact of these interventions was measured by firm performance on four levels of disability outcomes, reflecting the sequential phases in the process; the incidence of injuries, the incidence of work-related disability (lost workday cases and workers' compensation wage-loss claims), the duration of disability, and overall disability prevention and management performance (total lost worktime). The study seeks to measure the marginal impact of the three levels of intervention on each of the four outcomes. Our empirical analysis correlates employer-reported levels of achievement on these policies and practices (independent variables) with employer-reported performance on the disability outcome measures (dependent variables), while controlling for a set of establishment characteristics (control and covariate variables).

The data collection and instrument development processes were guided by a multidisciplinary team. It utilized experts and scholarly literature from safety and prevention, disability management, workers' compensation, and research methods. The project was conducted in a collaborative manner that encouraged input from our business, labor, and government advisory committee, the sponsoring SET Division of the Michigan Department of Labor and its SET Consultants, statistical experts, and other subject matter experts from both the business and academic worlds.

The primary database for the study consisted of the 220 employer responses to the random sample survey conducted in seven industries in the first half of 1991. The survey achieved a response rate of 46 percent, with three mailings and a final telephone follow-up. The 9-page survey instrument gathered self-reported information about how frequently firms achieve some 95 specific behaviors (0 percent of the time (never), 25 percent, 50 percent, 75 percent, or 100 percent of the time (always)). In addition, companies were asked to provide data about the number of injuries, lost workday cases, lost workdays, and the number of disability claims experienced over the 1986 through 1989 period.

Administrative data were also obtained from the Michigan Employment Security Commission and the Bureau of Workers' Disability Compensation for the survey firms and all other firms. This allowed comparison of workers' compensation claims experience of respondents to the survey with nonrespondents. Since only 46 percent of surveyed firms responded, it is important to control for nonresponse bias in generalizing these findings to a broader population. Survey respondent firms were larger in size and generally better performers than nonrespondents when compared on their workers' compensation claim experience reported in the administrative data. Respondents realized about 20 percent fewer workers' compensation claims and 20 percent lower workers' compensation payments than nonrespondents. Firms in the Detroit metro area were less likely than others to respond, while firms in the Grand Rapids metro area were more likely to respond. There were no statistically significant differences in response rates by industry. The conclusion is that there is some response bias evident in the data, but that it can be contained through size and industry controls.

The hypotheses to be tested regard the impact of the policy and practice behaviors on the firm's performance in preventing disability and mitigating its duration. Thus, the way in which the behavioral scale items are organized is important to understanding the results. The 95 behavioral items were originally organized into eight scales for collection on the survey instrument. These were regrouped and reclassified, based on a factor analysis that took into account the ways in which the responses cluster together, into the eight policy and practice variables used here. We describe the eight policy and practice variables before highlighting the empirical findings.

1. People Oriented Culture

This factor represents behaviors and policies that stem from conscious decisions on the part of management to cultivate and involve its human resources in positive ways. These decisions are reflected in:

- *positive work relationships and employee morale*
- *attention to interpersonal skills and open communication*
- *regular and meaningful involvement of employees in company operation and decisions*
- *sharing and seeking information*

It is unlikely that a culture of this type could be achieved without formal means in a large organization; it is likely to be an articulated management value with structure and process mechanisms to support and realize these aims. In small organizations, where the operational manager has direct involvement with all employees, it may reflect sheer force of personality of key leaders.

2. Active Safety Leadership

This factor refers to the personal responsibility and participation that top management and company leaders at all levels assume for safety. Such leadership includes:

- *implementing a system of accountability for safety at all levels to assure participation*
- *modeling vigilance in the investigation of identified risks and hazards*
- *continually identifying risks through a comprehensive system of data analysis and reporting*
- *committing resources to address and respond to safety needs*
- *seeing that he/she is personally knowledgeable of safety risks*
- *demonstrating support of designated leaders in safety initiatives*

Active Safety Leadership operationalizes the concept of "management commitment" that is identified by practitioners as an essential aspect of successful safety efforts in any company.

3. **Safety Diligence**

This factor describes the rigorous behaviors of companies that act on their stated safety goals and put their safety measures into practice. Safety diligence is evident in:

- *excellent housekeeping and continuous equipment maintenance*
- *timely investigation of risks and accidents that uses problemsolving for immediate correction and future prevention*
- *constant compliance with company safety measures and the use of disciplinary action for violations*
- *emphasis on safety in all aspects of plant operations*

Mastering these behaviors requires that managers, supervisors, and employees accept safety as a central part of work operations and have integrated critical behaviors, work processes, and safety procedures as a regular part of their functions.

4. **Ergonomic Solutions**

This is a small factor of four items that represent strategies used to address problems of repetitive motion and stress and strain injuries. These include:

- *reducing lifting demands*
- *reducing repetitive movements*
- *improving work flow*
- *modifying assigned tasks*

As measured in this factor, the strategies reflect corrective ergonomic solutions that would be utilized after a workplace problem is recognized, in contrast to ergonomic strategies designed into the original work environment to prevent ergonomic risks from occurring.

5. **Safety Training**

This factor consists of four items that address the timely provision of safety information that:

- *includes regular employees, temporarily assigned and new employees, and supervisors*
- *addresses all relevant hazards and applicable safe work practices*
- *is provided prior to undertaking duties and on an ongoing basis*

6. **Disability Case Monitoring**

This factor describes administrative procedures and a managerial process for monitoring disability cases on a consistent basis by a designated representative of the company. Such procedures include:

- *monitoring the validity, progress, and outcomes of lost time cases*
- *evaluating the disability process at critical points*
- *consulting with providers of health care, case management, and rehabilitation services*

However, the manner in which these functions are carried out can vary greatly according to the human resource philosophy of the firm and/or the interpersonal skills of its representatives. When employees perceive the motivation of these procedures to be directed solely at achieving control and cost containment, they may in fact promote an adversarial climate.

7. **Proactive Return-to-Work (RTW) Program**

This factor describes supportive, company-based interventions for personally assisting the parties involved in an injury or disability, from the beginning of the incident to its positive resolution. In a proactive program the actions and responsibilities of individuals within the company and external providers are spelled out and related to the goal of resumption of employment. Specific aspects include:

- *active involvement of the injured employee and his/her supervisor throughout the RTW process*
- *creative placement strategies to accommodate and accomplish RTW*
- *cooperative involvement across departments in the firm to achieve RTW*
- *timely and continuous coordination of external providers with the RTW goals*

Taken together, the items describe a planned and coordinated effort by the organization for the return-to-work of injured employees.

8. **Wellness**

This factor contains three items that indicate a company's orientation to health promotion as measured by:

- *commitment of resources to support health promotion or wellness*
- *top management support and participation*
- *provision of data about health status and risk factors to employees*

These indicators suggest a company that has gone beyond expressing interest in wellness and has begun to operationalize this commitment as a part of its corporate culture and its benefit programs.

Empirical Findings

This section highlights the association between levels of achievement of the policy and practice behavioral variables and the disability prevention and management performance measures.

Summarized here are the results of multivariate regression analyses of four disability performance measures over the period from 1987 through 1989. The measures include: lost workday cases per 100 workers, lost workdays per lost workday case, workers' compensation wage-loss claims per 100 workers, and total lost workdays per 100 workers. In each estimated equation, the simultaneous influence of a set of explanatory variables on the outcome measure is assessed. These explanatory variables fall into three groups; control variables, covariates, and independent variables.

The control variables represent the employment size and industry of the establishment. They control for differences in final product, production technique, and other determinants of the inherent accident and disability risks of the firm. They also differentiate between the performance levels of establishments of different sizes, on the assumption that there are economies of scale in preventing injuries and disabilities. It would be unreasonable to suppose that a firm of 100 employees has the same policy options or resources as a firm of 1,000 employees.

The covariates used vary with the specific outcome measure, but include such things as the percent of employees at the establishment with less than one year of experience, the percent of the workforce that is salaried, the presence of a union, the nature of the workers' compensation insurance arrangement, the wage level for hourly employees, and others. These variables were designed to hold constant the influence of specific establishment factors other than the independent policy and practice variables, so that the impact of the independent variables could be determined without interference from these factors, which are important but not directly linked to intervention.

In regard to impacts attributed to the covariates, our results show that most injury and disability measures vary positively and significantly with the percent of employees with less than one year of tenure, with self-insured workers' compensation insurance status, and with the presence of a union. Wage level effects are negative, when significant, meaning that establishments with higher wage levels generally have lower disability incidence. As for the control variables, usually the mid-sized firms (250 to 499 employees) have the poorest performance on disability measures and the large firms (over 500 employees) the best. These

results are not always consistent across the various outcome measures, however, and the details are not reported here in the interest of brevity.²

Finally, the independent variables are those for which the study was specifically designed to quantify the connection with the disability outcome variables. The independent variables are the eight policy and practice variables introduced in the last section. These variables are grouped according to theoretical expectations about their influence and are reported together in a graphical presentation. In each analysis, the variation in disability performance outcome associated with a 10 percent difference in the independent variable(s) is pictured, so that the terms of reference always have the same relative magnitude. The representation is in percentage terms to facilitate interpretation of the degree of the relationship regardless of the actual levels of performance observed.³

Two of the policy and practice variables have been treated separately, namely Active Safety Leadership and People Oriented Culture. These managerial variables determine the attitudinal and relational environments that are essential underpinnings for successful implementation and acceptance of policies and programs to achieve safety and return to work (see figure 1). Thus they are probably necessary, although not sufficient, conditions for achieving successful disability prevention and management. However, because of the fact that the managerial and operational elements tend to occur together, it is difficult to isolate the influence of both managerial and operational elements simultaneously. Therefore, these managerial dimensions are not featured in this summary, however they will be discussed briefly under lost workday rates below.

Lost Workday Case Rate

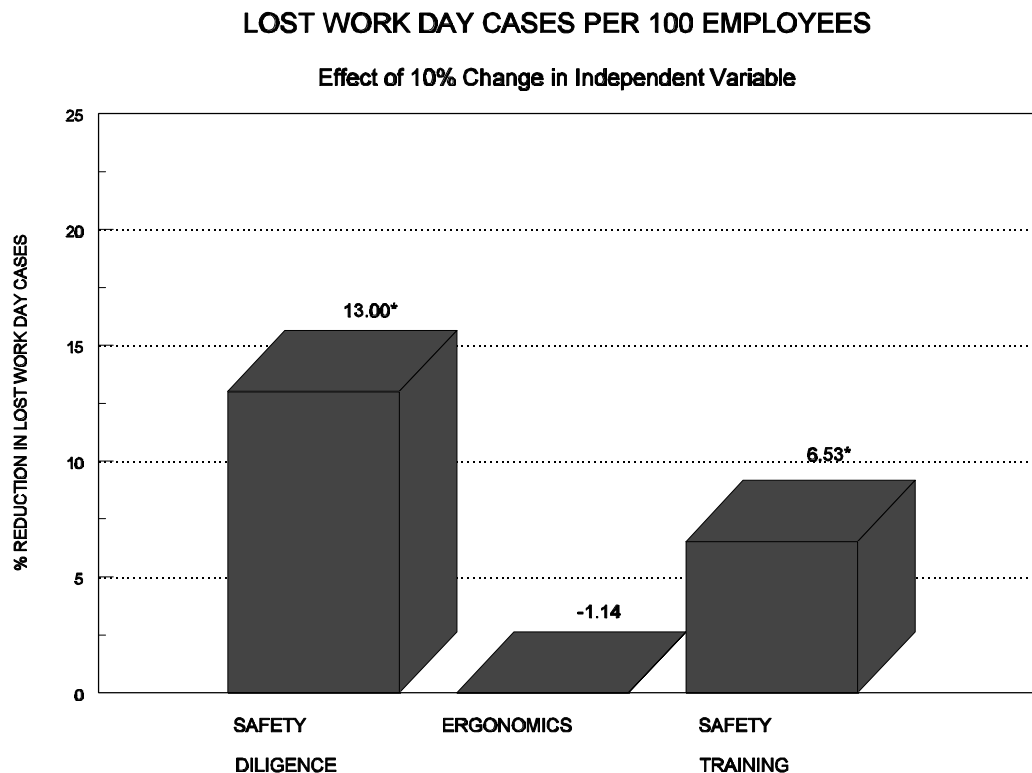
Figure 2 is the first graphic representing the analysis approach explained above. It depicts the effect that a 10 percent greater level of performance on each of the specific operational variables has on the number of lost workday cases per 100 employees each year, averaged over the 1987-89 period.⁴ It includes the study variables of Safety Diligence, Ergonomic Solutions, and Safety Training. Figure 2 shows that a 10 percent higher self-reported score on Safety Diligence is associated with 13 percent lower incidence of lost workday cases across our sample. The asterisk indicates that this coefficient is significantly different from zero at a 95 percent confidence level (one-tailed test). This is a very impressive impact for the Safety Diligence dimension. It indicates that rigorous pursuit of safety goals pays substantial dividends in reduced injuries.

²See the full technical report for these detailed results, Hunt, Habeck, VanTol and Scully (1993).

³It should be noted that these elasticity estimates are most reliable for relatively modest changes around the mid-point of the distribution. They may not be accurate for firms that are much better or much worse than average.

⁴The study excluded restricted days from this measure. Only cases involving at least one day lost from work are included here.

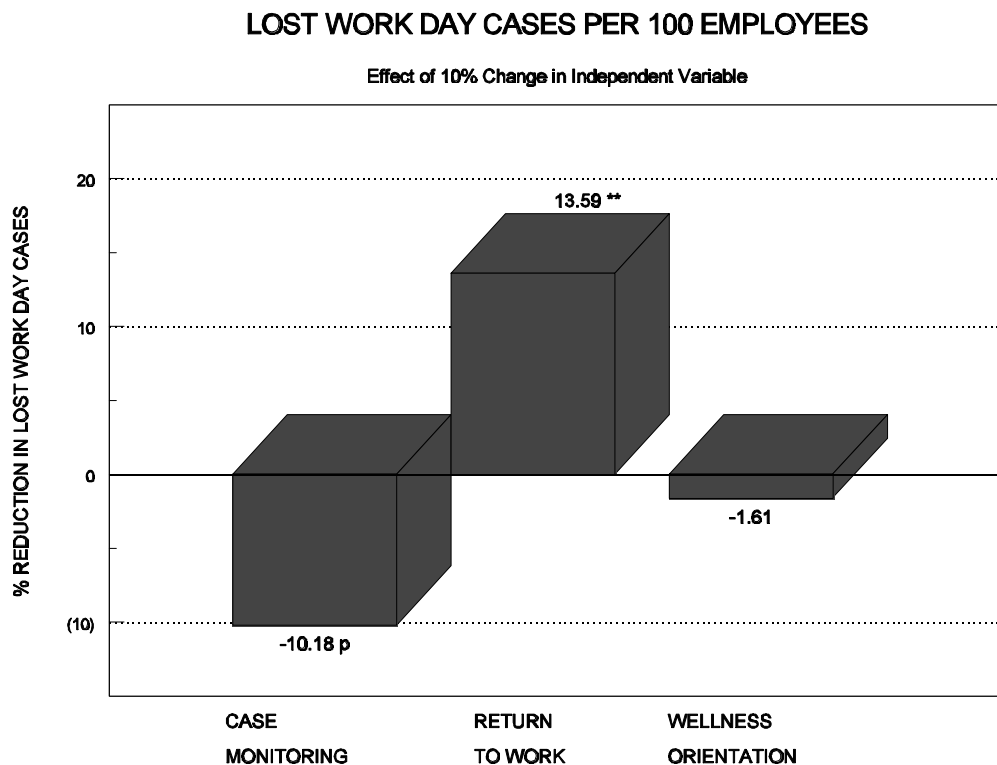
Figure 2



In addition, figure 2 shows that there are substantial gains to be achieved through greater Safety Training as well. The figure shows that a 10 percent higher self-reported level of Safety Training was associated with a 6.5 percent lower incidence of lost workday cases. This confirms the findings of the pilot study, which showed that training employees before their exposure to a new job situation was important in reducing workers' compensation claims (Habeck, Leahy, Hunt, Chan and Welch, 1991, table 2). Finally, the figure shows that our Ergonomic Solutions variable could not be significantly associated with variation in lost workday case incidence (no asterisk). This does not mean that ergonomics has nothing to contribute, but simply that there was no connection between ergonomic efforts, as measured in our instrument, and performance outcomes across our sample. This could be because the payoff is not quick enough to measure the impact of these behaviors with the outcome data available, or because our measurement of the factor is inadequate.

Figure 3 shows the same analysis for those operational variables associated with disability management efforts; Disability Case Monitoring, Proactive Return-to-Work (RTW) Program, and Wellness Orientation. In this case, the Proactive RTW Program variable shows a large impact. Those firms reporting 10 percent greater level of achievement on the Proactive RTW Program variable demonstrated a 13.6 percent lower rate of lost workday cases. This highly significant result is impressive evidence of the potential savings deriving from an effective return-to-work effort.

Figure 3



On the other hand, the figure also shows that Disability Case Monitoring was not associated with lower incidence of lost workday cases. Indeed, 10 percent better achievement of Disability Case Monitoring was associated with higher incidence of lost workday cases in our sample.⁵ This unexpected result might be explained by the nature of the application of case monitoring techniques. Careful comparison of the two dimensions of Proactive Return-to-Work Program and Disability Case Monitoring leads to the observation that the Disability Case Monitoring elements can be thought of as the administrative or controlling actions by the employer, as compared to the intervention or assistive actions represented in Proactive Return-to-

⁵The ρ indicates that this coefficient is significantly different from zero at the 90 percent confidence level (one-tailed test).

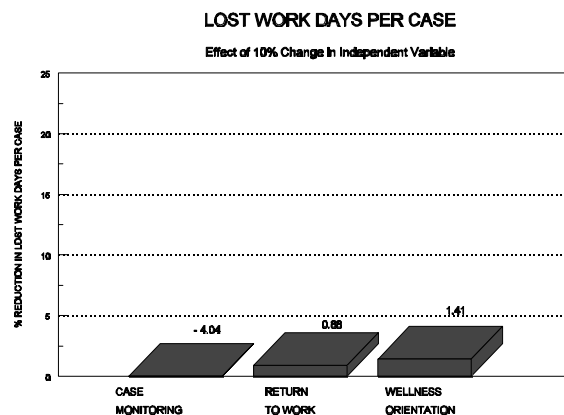
Work. It is obvious that such actions can be applied in a positive People Oriented Culture, but they can also be applied in a more punitive, less supportive environment. This may mean that our measurement of Disability Case Monitoring does not effectively distinguish between those employers who apply such measures in a supportive environment versus those who use it to monitor and control their disability cases without the supportive culture. It is possible that the results of Disability Case Monitoring are different in these two situations.

Figure 3 also shows that Wellness Orientation is not significantly associated with the level of performance on lost workday cases. As with Ergonomic Solutions, this may reflect a less immediate payoff to wellness initiatives or simply inadequate measurement of the factor.

Lost Workdays Per Case

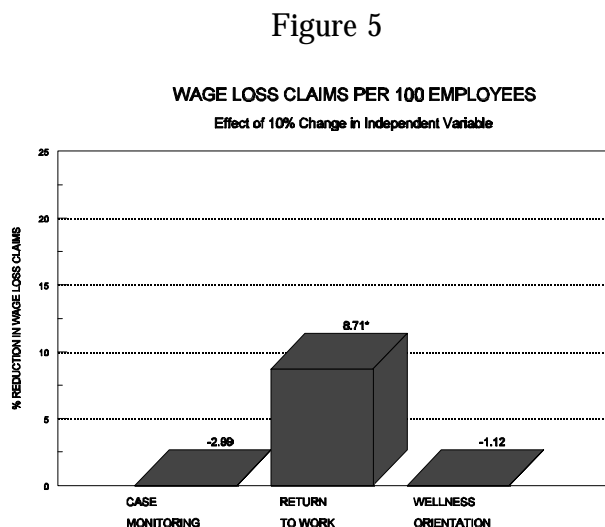
Figure 4 shows a lack of relationship between the policy and practice variables and the dimension of lost workdays per lost workday case. None of the operational elements, Disability Case Monitoring, Proactive Return-to-Work Program, or Wellness Orientation, proved to be significantly related to the reported average duration of disability in the sample firms. This is a troubling result, inasmuch as the disability management techniques were expected to demonstrate substantial impact on duration. Since duration of lost workday cases is generally on the rise and creating a costly and challenging problem for business, this finding begs for further research to determine the underlying causes of this outcome.

Figure 4



Workers' Compensation Claim Rate

Figure 5 shows the impact of relevant policy and practice variables on the incidence of workers' compensation wage-loss claims among the firms in our sample.⁶ The reported achievement of a Proactive Return-to-Work Program is strongly associated with a lower workers' compensation claim rate. For a 10 percent greater achievement in this dimension, a reduction of 8.7 percent in workers' compensation claims incidence was measured across the firms in the sample. Given that Michigan has a 7-day waiting period for wage-loss benefits, this means that a significant number of workers' compensation claims can be prevented with an effective return-to-work program, i.e., their duration can be reduced below seven days.



The figure also shows that the Disability Case Monitoring variable did not prove to have any significant impact on the rate of workers' compensation wage-loss claims across our sample. Presumably, the same explanation offered above would apply in this instance. Finally, the Wellness Orientation variable was also not found to be associated with the incidence of workers' compensation wage-loss claims in our sample. Its coefficient was not significantly different from zero. Again, this may reflect the long-run nature of the relationship between Wellness Orientation and workers' compensation claims incidence, or it may reflect inadequate measurement of the Wellness Orientation dimension in this study. It does not prove that Wellness Orientation has no payoff in reducing workers' compensation claims, it simply means that this study cannot supply credible statistical evidence of any connection.

Lost Workday Rates

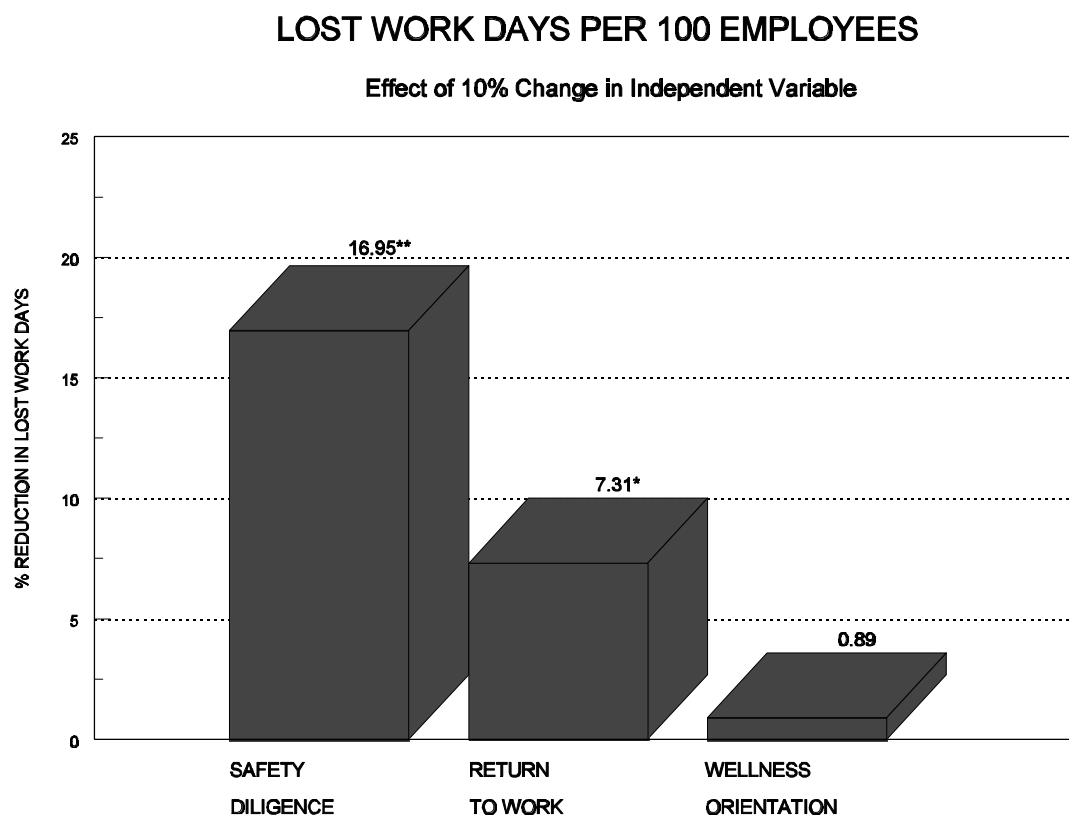
Because lost workdays per 100 employees is the product of the number of lost workday cases and their duration, it is the most general measure of an establishment's disability performance available from the MIOSHA log data. Figure 6 displays the results for the impact of policy and practice operational variables on lost workdays per 100 employees. It draws on the conceptual model of figure 1 to select the leading independent variables from each intervention level, namely Safety Diligence, Proactive Return-to-Work Program, and Wellness Orientation.

Figure 6 shows that Safety Diligence has a very powerful effect on lost workday rates. A 10 percent higher self-reported level of Safety Diligence is associated with nearly a 17 percent

⁶Medical only claims are excluded.

lower level of lost workdays per 100 employees in our sample. The asterisks indicate that this coefficient is significantly different from zero at the 99 percent confidence level. This result demonstrates that preventing an injury in the first instance is still the best defense against disability. In addition, the Proactive Return-to-Work Program variable also has powerful disability reduction potential. The figure shows that 10 percent better performance on this dimension is associated with 7.3 percent lower lost workdays per 100 employees across the sample. Thus, there is substantial scope for reducing the duration or cost of disability, even after reducing the incidence of injuries through Safety Diligence.

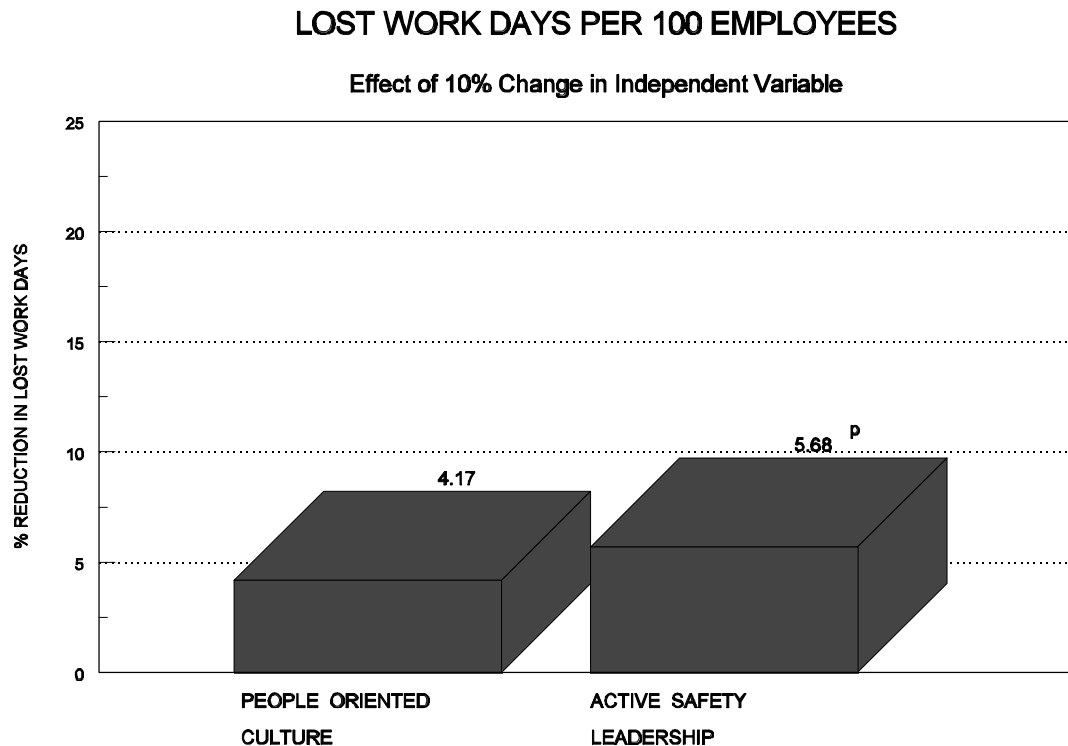
Figure 6



On the basis of this evidence, Safety Diligence and Proactive Return-to-Work Program represent the two primary phases of disability prevention and management required for an effective company program. The estimated relationships promise that even with only a modest improvement of 10 percent in these efforts, a company might expect to achieve a combined reduction of 25 percent in its lost workday rate with this integrated and comprehensive approach. As observed earlier, Wellness Orientation is not associated with lower lost workday rates for the firms in our sample.

The managerial elements of organizational policy and practice have been ignored until now in this exposition because of the difficulty in measuring their independent effects. However, figure 7 shows the impacts of People Oriented Culture and Active Safety Leadership on the number of lost workdays per 100 employees. For this summary measure of disability incidence and severity, both managerial elements have modest impacts. Organizations that scored 10

Figure 7



percent higher on Active Safety Leadership reported an average of 5.7 percent fewer lost workdays, while organizations that scored 10 percent higher on People Oriented Culture experienced 4.2 percent lower lost workdays per 100 workers.

These effects should not be thought of as additive with operational variable effects, since they are not estimated in the same model, but this figure contributes to the growing evidence of the important association between these global environmental factors and workplace disability. As indicated earlier, these managerial factors can be thought of as necessary, but not sufficient, conditions for good disability prevention and management outcomes. They are believed to support and encourage the development of effective disability prevention and management systems.

In summary, these quantitative findings present powerful evidence of the connection between employer policy and practice dimensions and disability performance levels in this sample of 220 Michigan establishments. The results presented here are the highlights of the findings

from the broader report, so they make a stronger, more consistent impression than is characteristic of the entire study. Still, the fact remains that these findings constitute strong support for a causal connection between company policies and practices in the injury prevention and disability management areas and disability performance results, as measured by the incidence of lost workday cases, workers' compensation wage-loss claims, and overall lost workday rates.

Site Visit Findings

The goal of the company site visits was to obtain an improved understanding of those firm-based behaviors that contribute to the effective prevention and control of work-related disability. An understanding of the operational details of these injury prevention and disability management factors can assist other firms in making improvements in disability prevention and management performance.

Site visit selection paralleled the mail survey sample in that companies were chosen from each of the three size classifications within six industries (SIC 20 was eliminated due to resource constraints) resulting in 18 sampling cells. Next, one high- and one low-performance company were chosen to represent the extremes of performance in each cell of the sampling framework (random selection was not used), in order to investigate behaviors that differentiated employers having very different outcome experiences. The rate of lost workdays per 100 employees was used as the primary indicator for selecting high- and low-performance companies. A total of 36 firms were selected, and 32 firms were successfully visited in the spring and summer of 1992.

In larger companies the length of the visit ranged from four to eight hours, with three to four individuals involved due to specialization of function. In smaller companies typically only one or two individuals were involved, and visits ranged from two to four hours. The interview protocol included the collection of updated establishment data through 1991 from MIOSHA log summaries, workers' compensation figures, and current employment data. The visit included: (1) a management overview about the business and its current economic climate, (2) an interview regarding initiatives for safety and injury prevention, (3) an interview concerning procedures for injury management and return-to-work, and (4) an interview regarding human resource management, wellness initiatives, labor management climate, and company culture. When permitted, a tour of the physical work environment also occurred.

Information and data gathered in the on-site visits were then dictated, transcribed, summarized, and analyzed. Major observations and findings from the high-performance and low-performance firms were compiled for conclusions. Exemplary models, unique ideas, and helpful resources were also documented. Finally, the two groups of firms were compared on the basis of their 1989 recorded information with respect to their disability performance (dependent

variables), organizational characteristics (covariates), and achievement of the policies and practices of interest (independent variables). These data are presented in table 1.⁷

The comparison of means between the high- and low-disability firm groups verifies the substantial difference in their experience of injuries, disabilities, duration and costs. As expected, the high-disability firms have substantially more injuries (higher MIOSHA recordable rates). More notably however, they have five times more lost workday cases per 100 workers and roughly 2.5 times greater lost days per lost workday case. As a result they have 3.5 times more wage loss claims per 100 workers, and nearly 12 times more lost workdays per 100 workers. These differences create very considerable advantages for the low-disability firms.

Differences in the organizational characteristics of these two groups parallel the quantitative findings. The low-disability firms tend to be larger, are less frequently self-insured, have a slightly higher hourly wage, have a significantly lower turnover rate, and have a lower but still substantial level of union representation. Most significantly, the low-disability group reports significantly more frequent engagement in the policies and practices of interest. In particular, they report much more frequently achieving Proactive Return-to-Work, Wellness Orientation (although neither group engages in this area with high frequency), and People Oriented Culture. This cluster emphasizes the human resource orientation present in these low-disability firms. They also achieve higher scores in Safety Diligence and Ergonomic Solutions as compared to the high-disability firms. The groups report more similar behavior in other areas, particularly Disability Case Monitoring. Taken together, this comparison highlights the tremendous differences across companies in their disability performance and supports the relationship between positive policies and practices and achieving better prevention and management of disability.

With respect to the qualitative findings from these visits, several observations can be

Table 1

Site Visit Firms (n= 32)		
High and Low Disability Group Comparisons		
	High Disability Firms	Low Disability Firms
<u>1989 Performance</u>		
Recordables/100 ee	27	17
LWD Cases/100 ee	10	2
LWD/Case	29	12
Wage Loss Claims/100 ee	7	2
LWD/100 ee	307	24
WC Losses/Employee	\$839	\$233
<u>1989 Characteristics</u>		
Size (Employment)	510	1531
Multiple Plants	78%	50%
Self-Insurance	56%	29%
Average Hourly Wage	\$10.37	\$11.12
Tenure < 1 year	7%	14%
Tenure > 10 years	42%	48%
Turnover rate	22%	12%
Union Representation	72%	57%
<u>Policies and Practices</u>		
People Oriented Culture	3.25	3.80
Active Safety Leadership	3.93	4.15
Safety Diligence	3.80	4.18
Disability Case Monitoring	4.31	4.47
Proactive RTW Program	3.41	4.07
Wellness Orientation	2.76	3.48
Ergonomic Solutions	2.97	3.43
Safety Training	3.99	4.20

⁷ Since these establishments were not randomly selected, statistical hypothesis testing is not appropriate. In particular, it is not possible to generalize from these samples to the broader population.

made with regard to all of the companies visited. The competitive business conditions of the last few years have created an economic climate that poses challenging dynamics in virtually all of the organizations visited. Companies with increasing market share and favorable profitability, as well as companies facing declining demand, are working hard to be responsive to customers, improve product quality, and achieve efficient utilization of resources.

Across these groups, we observed a general shift toward the principles of total quality management, which has led to changes in traditional work cultures and roles. For example, as part of the quality movement many firms have shifted toward the use of work cells and/or work teams. This change in work flow has facilitated the use of job rotation, which in turn has helped some companies to address training and promotion opportunities, and to prevent risks of repetitive strain and cumulative trauma by altering work functions. Further, some companies have found that placement of workers with restrictions has been easier to accommodate in a work-team concept.

Throughout our visits we observed many innovative measures undertaken by firms to improve their safety and disability performance. In fact, we noted that the high-disability firms who participated in the site visits were often very knowledgeable of their problems and were motivated to change, or were actually involved in changing, their performance. Available data support the effectiveness of their initiatives to date. As compared to their performance in 1989, the high-disability companies by 1991 reported significant reductions in their recordable rate, lost workday case rate, and total workers' compensation costs. The low-disability firms by comparison held relatively steady in their performance measures through 1991. This, of course, is still an achievement, since numbers in these areas were generally increasing during this time period. Thus, successful strategies were identified from both high- and low-disability firms that offer helpful suggestions for companies looking to improve their situation.

Successful Initiatives

Successful firms effectively use internal data to measure their performance, to identify their specific problems, to inform management, supervisors, and employees of results on a regular basis, and to strategically guide the actions they take to improve their situations. Typically, top management has been motivated to address safety and disability performance because they are aware of the costs they encounter in these areas, but they are also aware that costs can be reduced. Thus, active involvement of top management in the policy and practice initiatives to be undertaken is identified as critical to successful change.

Successful firms are highly rigorous in their investigation of injuries; more important, they emphasize an immediate response once problems or risks are identified. Thus, while policy statements have value in motivating employee attention to safety, management behavior that is responsive and timely is more convincing. In these firms, injury incidence and lost workday performance are viewed as part of both the company's and the individual's overall quality and production goals.

A supportive culture was often evident in companies that had been successful in their efforts. In these cases employees are considered as respected and valuable members of the organization, and thus are provided information to help them understand the relationship between the company's safety and disability performance and the financial well-being of the company and its employees. The employees in these cultures typically identify with the goals of the organization, and they are treated as active participants in achieving these goals.

Innovative companies have moved upstream in their safety efforts to "design in" prevention through ergonomic initiatives. They have analyzed their data to identify root causes of their high-cost and long-duration disability cases and have used ergonomic solutions to remove these risk factors from their work process and equipment design. Successful organizations have also developed management systems that communicate and achieve supervisory accountability and involvement in their safety and return-to-work efforts.

Successful companies have devoted extensive effort to developing effective working relationships with a designated, knowledgeable, and responsive health care provider. For some companies, this has meant the acquisition of an in-house provider, and for others the careful recruitment and selection of a community provider. Procedures to facilitate immediate and ongoing communication on the outcomes of evaluations and treatments, and recommendations and time frames for accommodation of return-to-work, are an essential aspect of these relationships for effective injury management. Similarly, these companies maintain an active role in case management, despite their use of case management assistance from their carrier and/or specialized case management service provider for complex or long-term cases. This "keeping in touch" function by the company with its employees seems essential to an effective program.

Finally, successful strategies for return-to-work have moved beyond designated light-duty jobs to more flexible and individualized responses to return-to-work needs. Successful companies have made their return-to-work process tailored to the needs of the case, transitional in nature with a focus on return to productive employment, and systematic to insure that these efforts occur in all cases.

Remaining Challenges

Despite the many successful strategies observed and the significant performance results that these companies have obtained, several remaining challenges were identified and observed. To begin with, it is difficult for all companies to achieve consistency, quality, and coordination in their case management efforts, whether within the company itself or with external parties. Some companies have attempted to more carefully analyze the internal process that occurs in response to an incident and its management. Through this process they are able to identify the gaps, overlaps, and discontinuities in their internal efforts and achieve more coordination throughout the organization. In large organizations this has become a significant barrier to achieving an integrated system for disability prevention and management.

The vast majority of companies express frustration with the lack of useful workers' compensation data available to support their efforts. Most companies have computerized their

MIOSHA log data and use it successfully to track and analyze their performance over time. However, timely and useful data about the incidence of workers' compensation cases, their medical and wage-loss costs, and their duration, are rarely available to individuals in the company who need these performance data to analyze their disability prevention and management efforts. Companies are eager to achieve more productive service from their insurance carriers or third-party administrators. They are becoming more assertive in their requests for responsive communication, technical consultation on loss prevention, and on the case management services they receive. At the same time, successful companies expect to maintain adequate internal control over these processes. In fact, many have achieved significant reductions in their claim reserves by demonstrating their capability for internal case management and return-to-work performance. Clearly, new roles and partnerships are being forged in the traditional relationships between insurance carriers and their employer clients.

Regardless of performance level, companies reported an increasing incidence of cumulative trauma and repetitive motion injuries. These were almost always cited as the most costly and longest duration of the disabilities these companies encounter. To some extent, successful companies have stemmed this tide by focusing on ergonomic and health promotion strategies to prevent their occurrence. However, every company has experienced some long duration cases of this nature that appear to be intractable to conventional interventions. Few successful strategies or innovative initiatives seem to have been developed for these intractable cases. It is interesting that little use of conflict resolution procedures, EAP resources, or other interventions that may relate to the underlying causes of some of these adversarial cases have been attempted, despite the fact that companies typically report that these cases usually involve individuals with poor prior work performance and attendance.

Because of concerns about the increasing incidence of disability resulting from cumulative trauma and repetitive strain, companies are often fearful of informing employees about signs and symptoms of their potential impending disability. However, early identification and intervention for these disability conditions has been identified as a far more effective strategy for their resolution than surgery and other treatments after onset of disability. Thus, opportunities for education and early identification of signs and symptoms is another component of prevention that merits further exploration. The development of preventive measures for the individual risks of disability has not yet become an active part of employer strategies. However, advanced employers indicate it may be possible to analyze disability risks, not only from the perspective of identifying ergonomic needs in workplace design and equipment, but also in identifying interventions for at-risk employees targeted to their conditioning and health enhancement. While some efforts along these lines have been introduced and found to be successful, they have not been widely implemented to date.

The disability prevention process requires a continuum of intervention that moves from safety to injury management to return-to-work to health promotion. Generally, companies are most advanced in their safety initiatives, are devoting significant attention to their injury management efforts, and have implemented at least some form of a return-to-work program. Few have ventured into systematic health promotion efforts that are targeted to the particular injury

and disability risks they confront. So it is likely that, as companies refine and develop their interventions across all phases of this continuum, and build a corporate culture and management support system for these efforts, further reductions may be obtained beyond those measured to date.

Conclusions

This study has gathered unique evidence about the incidence of lost workday cases, workers' compensation wage-loss claims, and total lost workdays among a random sample of Michigan establishments. Further, it has shown that better performance on these disability outcome measures is statistically associated with higher degrees of achievement of certain company policy and practice dimensions, particularly safety diligence, safety training, and proactive return-to-work programs. These disability prevention and management behaviors were further explored through site visits with a subsample of the employers participating in the study. The findings of the larger survey were confirmed, and additional lessons learned from these case studies. This is the strongest evidence to date connecting employer policies and practices with disability performance. However, even this study cannot conclusively prove that firms with poor disability records can substantially improve their performance by emulating the behaviors more frequently found in high-performance firms; only a longitudinal intervention study could do that. But our conclusion is that it is a reasonable inference that if some employers are consciously trying to do better at preventing and managing disabilities, and succeeding, that other employers have this same potential.

Many employers have realized that disability incidence and costs are, at least to some degree, within their control. Some have moved aggressively to reduce the incidence and the costs of disability in their workplace. Dramatic results have been achieved, but this study also demonstrates that much more remains to be done. Employers who are already at the leading edge will undoubtedly keep pushing that edge further out, to even lower disability incidence and lower costs. Employers who have not yet begun to pursue disability prevention and management strategies aggressively will find that this is an increasing source of competitive disadvantage. One could argue that policymakers seeking equitable solutions to the crisis of disability costs should include incentives for these positive employer behaviors in policy initiatives. This might promise cost control that is supportive of the interests of the true stakeholders in work-related disability, employers and employees. The challenge has been issued; disability can be managed and those who do it well can expect to be rewarded with lower disability costs, more satisfied workers, higher productivity and, ultimately, higher profits. Our hope is that this study will help to show the way.

References

- BLS (1990). Occupational injuries and illnesses in the United States by industry, 1988. U.S. Department of Labor, Bulletin 2366. Washington, D.C.: BLS.
- Burton, J.F. (1992). "Workers' compensation costs in 1991," Workers' Compensation Monitor, 5(3).
- Chelius, J., Galvin, D. and Owens, P. (1992). "Disability: It's more expensive than you think," Business and Health, 11(4).
- Habeck, R.V., Leahy, M.J., Hunt, H.A., Chan, F., & Welch, E.M. (1991). "Employer factors related to workers' compensation claims and disability management," Rehabilitation Counseling Bulletin, 34(3).
- Habeck, R.V., Leahy, M.J., & Hunt, H.A. (1988). Disability prevention and management and workers' compensation claims. Report submitted to Bureau of Workers' Disability Compensation, Michigan Department of Labor. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.
- Hensler, D.R., et al. (1991). "Compensation for accident injuries in the United States." Santa Monica, California: RAND Institute for Civil Justice.
- Hunt, H.A., Habeck, R.V., VanTol, B., and Scully, S.M. (1993). Disability prevention among Michigan employers. Report submitted to SET Division, Michigan Department of Labor, May 1993.
- National Industrial Rehabilitation Corporation (1991). Hospitals and work disability: A summary fact sheet. Columbus, OH: NIRC.
- MIOSHA (1990). Occupational injuries and illnesses survey, Michigan 1988. MIOSHA Information Division, Michigan Department of Labor in cooperation with U.S. Department of Labor, Bureau of Labor Statistics.
- Rousmaniere, P. (March 1990). "Stop workers comp from shooting holes in corporate profits," Corporate Cashflow.
- Thompson, R. (November 1991). "Putting the brakes on workers' comp," Nation's Business.