



Workers' Compensation

Workers' Compensation

Analysis for Its Second Century

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Acknowledgments

This project originated in 2014, as Allan Hunt retired from the Upjohn Institute after 35 years. The coincidence, around that time, of the 100th birthday of many of the workers' compensation programs in the United States created an opportunity for assessment that was hard to miss. In addition, Randall Eberts, president of the Upjohn Institute, thought it would make a good transition if Hunt worked on the project with Marcus Dillender, a new hire at the Institute who was interested in issues of health care and disability. So, the match was made with Institute support, and three years later this book is the result.

We need to acknowledge the usual debts that are incurred in a project like this. First, we are indebted to our colleagues at the Institute and around the world for the research they have done previously. We humbly acknowledge our intellectual heritage as we cite these sources. At the Upjohn Institute, Lillian Petrovic and Jason Preuss provided outstanding research support, as did Joan Maltby, Sue Berkebile, and Claire Black on the clerical side. Ben Jones and Allison Colosky did the editing, and we also wish to thank the two anonymous peer reviewers. As usual, Kevin Hollenbeck provided the calm, informed leadership we have all become accustomed to.

Last, but not least, we thank our family and friends, who put up with the sometimes annoying question, "What do you think of this?" We sincerely hope that the result will justify the investment in their eyes.

—H.A.H.

—M.O.D.

Chapter 1

Introduction

Workers' compensation programs constitute the original example of public "social insurance" in the United States, dating to the early twentieth century. They also represent the first "no-fault" insurance programs, as they replaced tort liability through the courts as a way to cope with the growing incidence of injuries as America became industrialized. These state government programs specify medical and wage-loss benefits that must be provided by employers for their workers who become disabled by work-related injury or disease.¹

The state and provincial workers' compensation programs for injured workers in North America emanate from a historical compromise. Workers who had an employment-related injury gave up their right to sue their employers under common law for negligence in exchange for receiving prompt and certain medical, rehabilitation, and wage-loss benefits. While the actual amount of compensation would be significantly less than would be received from a successful tort liability suit, the certainty of receiving benefits that would be adequate and equitable would be worth the trade-off.

Over the years, the programs have been subjected to intense partisan criticism, interpretation and reinterpretation by the courts, and reforms and re-reforms as the political winds have blown back and forth. Now, as workers' compensation programs pass the century mark since their original enactment, it is time for a reevaluation (Grabell and Berkes 2015; USDOL 2016).

This volume represents an effort to draw policy implications from research in three critical performance areas for workers' compensation programs: 1) the adequacy of compensation for those disabled in the workplace, 2) return-to-work performance for injured workers, and 3) prevention of disabling injury and disease. We believe these are, or should be, the three most important objectives for workers' compensation systems. Thus, the three chapters that follow, dealing

in turn with these three topics, provide our assessment of the performance of workers' compensation systems after the first 100 years. We explore best practices among the states and find hopeful signs of progress in some states. Furthermore, we believe these best practices could provide the outline of an agenda for true reform of workers' compensation in the United States.

It is clear that additional research on workers' compensation programs is needed—particularly research that uses similar methods and types of data across different states to build a consensus of comparative results and policy insights. But research on workers' compensation policy issues faces many hurdles. First, state workers' compensation systems differ significantly from each other, in both substantial and trivial ways. Sometimes these differences are obvious and make direct comparisons impossible. Other differences are more subtle and therefore easy for the researcher to miss, making comparisons misleading. This is particularly annoying to those state officials who are expert in their own system and protective of its public image. In either case, direct comparisons between systems are difficult, and potentially dangerous, in a contentious political environment.

In addition, research studies designed to answer specific policy questions in different jurisdictions likely used different data and methods and for those reasons may not be directly comparable. This is demonstrated by the research on benefit adequacy in workers' compensation that is reviewed here. As a result, research studies on workers' compensation programs often are descriptive and focus on one or a small number of jurisdictions to preserve their credibility.² But of course that undermines their effective application to other systems.

Because of these and other barriers, the burden of sponsoring policy-relevant research falls pretty much on the workers' compensation systems themselves. And to say that the administrators of these systems are not always eager to consider a "research solution" to a policy problem would be a considerable understatement. Given the intensely political environment when dealing with relations between labor and business—relations that also involve serious cost issues—

keeping one's head down is a good strategy for workers' compensation administrators.

Nevertheless, the Upjohn Institute for Employment Research has conducted, supported, and published research on workers' compensation programs for nearly 40 years. We began with the specific policy issue of inflation protection for injured workers in the Michigan workers' compensation system in the late 1970s (Hunt 1981). Over the years, our activities expanded to include many of the major issues around preventing and compensating for disability at the state, federal, and international levels.³

In this book, we review the status of state workers' compensation programs on the three critical performance dimensions mentioned earlier (benefit adequacy, return-to-work performance, and prevention) at the programs' centennial milestone, using the research record that has been compiled to date. We do not offer a comprehensive review of the literature but rather provide a more selective sampling of research on these policy issues. We have based our conclusions largely on our own research, on research the Upjohn Institute has published, and on other research familiar to us. Thus, this volume has a more personal perspective than the typical research publication.

We sincerely hope that these analyses will prove useful for policymakers and policy researchers who are eager to carry the torch forward and see that much-needed improvements are made. It is vital that we determine whether these century-old programs still have the capacity to resolve the societal problems of occupational injury and disease, or whether they need more than mere updating.

Notes

1. There are several good introductions to workers' compensation available. See Baldwin and McLaren (2016).
2. But see the New Mexico study of comparative permanent partial disability (PPD) compensation adequacy for an outstanding counterexample in Reville et al. (2001).
3. See research.upjohn.org/workcomp_dis/ for all relevant Upjohn Institute publications since 1980.

Chapter 2

Benefit Adequacy and Equity

Workers' compensation programs for workers disabled by their work are the oldest social insurance programs in the United States and Canada. Issues of benefit adequacy and equity have been central to workers' compensation systems from the start, at the beginning of the twentieth century.

The simplest way to assess the adequacy and equity of benefits is with reference to the statutory framework.¹ What level of wage replacement is specified by statute? The most common index among U.S. states is 66.67 percent (two-thirds) gross wage replacement.² This reflects the fact that such wage-replacement benefits are free of any federal or state tax, as well as a desire by policymakers to maintain work incentives by ensuring that there is a net benefit to working. The fact that there are specific caps on maximum benefits in all workers' compensation states, and that minimum benefits are provided in most, also clearly indicates that there has been some legislative judgment of the amount of wage replacement that is thought to be appropriate.

Equity is also relatively simple to measure in concept. An equitable system is one in which all workers would be treated the same, or those in similar circumstances would be treated in similar ways. These policy concerns directly introduce an element of social welfare into the evaluation of workers' compensation benefits.

Beginning at least with Professor Arthur H. Reede in 1947 (whose seminal work, *Adequacy of Workmen's Compensation*, is cited in Somers and Somers [1954], p. 80), scholars of workers' compensation have struggled to provide an accurate assessment of benefit adequacy. Obviously it is a prime point of contention between the interests of injured workers and the employers who pay for their workers' compensation insurance. It is also a major influence on any assessment of the sociopolitical performance of workers' compensa-

tion programs as a way of handling the consequences of industrial injuries and illnesses.

This chapter will review the empirical evidence from existing studies of benefit adequacy and equity in workers' compensation programs in the United States and Canada. We concentrate on both findings and methods, since there is still disagreement about the "best" way to measure benefit adequacy empirically. We pay particular attention to a pair of recent Canadian studies that have not had much exposure. These studies are notable for their thorough and original exploration of the implications of methodology in such research. Our expectation is that our paper will help to stimulate additional discussion and perhaps prompt new studies of benefit adequacy and equity performance by these important social insurance programs.

PREVIOUS STUDIES

One method that researchers have employed to study benefit adequacy has been to conduct interviews of injured workers. Johnson, Cullinan, and Curington (1979) studied benefit adequacy by interviewing nearly 2,000 workers' compensation beneficiaries with severe permanent impairments in California, Florida, New York, Washington, and Wisconsin. They examined both the extent to which injured workers received workers' compensation benefits and the degree to which people receiving benefits were compensated for their lost wages. They found that the average total wage loss during the five to seven years after injury was \$5,842 in 1975 dollars and that almost three-fourths of the sample were still experiencing significant wage loss (at least \$500 per annum) at the time of the survey. Approximately 10 percent of the sample never returned to work after their injuries, and these individuals had a 22 percent wage replacement rate for the entire period. Among those still receiving workers' compensation benefits at the time of the survey, only an average of 12 percent of the wage loss was being replaced five years after the injury.

Johnson, Cullinan, and Curington called the replacement rate “clearly inadequate” (p. 97).

The California Workers’ Compensation Institute commissioned another interview study of benefit adequacy in California in the early 1980s. As part of the study, an independent research firm interviewed 1,076 people with workers’ compensation claims from 1975 and 1976 six to seven years after the injury. The study found that the California workers’ compensation system on average replaced 49 percent of lost earnings, and that people with the lowest disability ratings (1–9 percent) had the highest replacement rate—over 80 percent. However, the study also found that for the most serious (permanent and total disability) claims, the replacement rate was 67 percent, as specified by statute. Nevertheless, the study concluded that the California workers’ compensation system provided benefits that were both inadequate and inequitable (CWCI [1984], cited in Hunt [2004], p. 105).

More recent benefit adequacy studies generally use workers’ compensation administrative data on injured workers, combined with wage records from a sample of comparison workers who were not injured, in an attempt to estimate what workers would have earned in the absence of the injury. They then calculate the loss replacement rate as the extent to which workers’ compensation replaces compensation that they would have earned in the absence of the injury.

$$\text{Loss replacement rate} = \frac{\text{WC income benefits}}{\text{Comparison earnings} - \text{postinjury earnings}}$$

Berkowitz and Burton (1987) implemented the first modern wage loss study of state workers’ compensation programs. In addition to describing the provisions of the varied programs for compensating permanently disabling injuries in 10 states, they also analyzed wage replacement performance in three states (Wisconsin, California, and Florida) in a project funded by the National Science Foundation and ultimately published by the Upjohn Institute. The findings were particularly stimulating because of the variety of disability evaluation

strategies employed in these states. At the time of the observed injuries in 1968, Wisconsin used an impairment-level standard, California used a loss-of-earning-capacity standard, and Florida offered injured workers their choice between the two standards (Berkowitz and Burton 1987, Chapter 10). If a judgment could be made about benefit adequacy under different disability evaluation methods, this would be valuable information for policymakers.

For a sample of workers' compensation injuries in 1968 from each of the three states, Berkowitz and Burton (1987) secured two years of preinjury wage data and five to six years (1968–1973) of postinjury earnings data from the Social Security Administration, as well as the actual workers' compensation indemnity benefits paid to the injured workers in California, Florida, and Wisconsin. Their comparison group to estimate wage loss consisted of California workers who were also injured in 1968 but whose injuries received less than a 5 percent permanent disability rating. They also calculated "expected growth ratios" for future wages by age, gender, and earnings level of the California sample and applied these ratios to similar workers in other states.

Berkowitz and Burton (1987) found that the overall wage replacement rates were 46 percent for California, 59 percent for Florida, and 75 percent for Wisconsin (p. 357). But the replacement rates varied widely between contested and uncontested cases.³ For contested cases, the replacement rates were relatively similar to the overall replacement rates for California (41 percent) and Florida (51 percent), which had high rates of disputes (90 percent and 70 percent contested claims, respectively). However, contested claims in Wisconsin were much less common (only 14 percent) and received lower wage replacement compensation at 58 percent.

For uncontested cases, however, the replacement rates were much higher for California and Florida. In California, Berkowitz and Burton (1987) found that injured workers generally had no losses in uncontested cases, meaning the replacement rate was infinite. In Wisconsin, the replacement rate was 85 percent for uncontested cases. In

Florida, they found that workers' compensation replaced 724 percent of earnings losses, on average. These results were troubling.

In addition to the high degree of variability in the replacement rate based on the litigation status of the case, Berkowitz and Burton (1987) found a high degree of variability in the replacement rate based on the age of the worker and the body part injured. These findings indicate that the workers' compensation programs in these states faced serious equity issues as well as adequacy issues.

Boden and Galizzi (1999) estimated wages lost from work-related injuries in Wisconsin by comparing injured workers who missed more than one week of work in 1989–1990 to workers with less severe injuries who missed less than one week of work. They found that the Wisconsin workers' compensation system replaced 64 percent of pretax lost wages for men and 50 percent of pretax lost wages for women with temporary total disability (TTD) and permanent partial disability (PPD) claims in the four to five years after the injury. But the replacement rates varied greatly by the amount of time missed from work. Workers' compensation in Wisconsin provided a replacement rate of over 80 percent for TTD claims lasting less than six weeks but a much lower replacement rate for TTD claims of longer duration. This was because people with longer-duration TTD claims experienced wage losses even after they no longer received workers' compensation benefits. Boden and Galizzi found that PPD benefits replaced 83 percent of lost income for men and 63 percent of lost income for women. So, again, there seem to be equity issues arising from the different rates of wage loss replacement for workers in different situations.

Peterson et al. (1998) and Reville (1999) studied replacement rates for PPD claimants in California by matching workers injured in 1993–1994 to uninjured workers employed at the same firm and with similar preinjury wages. They found that injured workers earned 40 percent less pretax than noninjured workers during the five years following the accident and that workers' compensation replaced 38 percent of this loss. Reville also considered earnings loss and replacement rates by disability ratings. He found that injured workers with

higher disability ratings experienced both higher earnings losses and higher replacement rates of those earnings losses than those with less serious injuries.

Biddle (1998) estimated lost wages for seriously injured workers in the state of Washington by comparing workers injured in 1993–1994 who received indemnity (wage loss) payments in the 3.5 years after an injury to those who had medical-only claims. He first showed that seriously injured workers who experienced time loss of 15 or more days experienced lost wages immediately in the quarter of their injury. After 3.5 years, the difference between the seriously injured workers and the control group of medical-only claims had shrunk but had not gone away completely. Biddle found that the Washington workers' compensation system replaced an average of 40 percent of after-tax lost wages for workers with time-loss claims over the 3.5 years after injury.

Unlike what Boden and Galizzi (1999) found in Wisconsin, injured workers in Washington who missed more time had higher replacement rates than those who missed less time. For workers with permanent disabilities, the after-tax replacement rates were over 100 percent. A possible explanation for this may be that Biddle (1998) had only 3.5 years of data after the injury. The most severely injured workers may have experienced losses for years after their benefits ceased, while PPD benefits are given in a lump sum after the injury in Washington. When Biddle projected 10-year replacement rates based upon presumptions about future earnings and workers' compensation benefits, the average PPD replacement rate shrank to 34 percent.

Biddle (1998) also investigated the distribution of wage losses across workers and how wage losses differed based on demographic characteristics and injury types. He found that a small number of workers experienced very significant wage loss. Of workers missing 15–60 days of work during the observation period, 10 percent were still experiencing large earnings losses one year after the injury. He found that workers under 26 years of age experienced higher earnings losses compared to older workers with similar preinjury wages.

Head injuries led to greater wage losses than injuries to other parts of the body, and married women experienced greater earnings losses than both married men and unmarried men. Injured workers experienced similar losses regardless of whether they were employed at self-insured firms or insured firms.

In the most ambitious effort to date, Reville et al. (2001) evaluated the benefit adequacy of workers' compensation for PPD claimants in New Mexico by comparing replacement rates for PPD claimants in New Mexico in 1994–1998 to PPD claimants in California, Wisconsin, Washington, and Oregon over the same period. To calculate replacement rates, they examined the degree to which workers' compensation benefits offset the earnings differences between workers with partially disabling occupational injuries and similar workers without injuries during the five years after the first group suffered injury. New Mexico PPD claimants lost 23 percent of their earnings on average during the first five years after the injury and 20.5 percent of their wages during the first 10 years after the injury.

During the first five years after the injury, the pretax replacement rate in New Mexico was 65 percent, nearly identical to the two-thirds statutory standard. During the 10 years after the injury, the pretax replacement rate fell to 46 percent, as benefits fell off more rapidly than did wage losses. Ten-year pretax loss-replacement rates were 37 percent, 42 percent, 41 percent, and 29 percent in California, Oregon, Washington, and Wisconsin, respectively (Table 2.1). Thus, New Mexico had the highest replacement rates of any of the states. However, after accounting for differences in industry composition between the states, New Mexico had a replacement rate that was in the middle of the states. Reville et al. (2001) found that claimants in the top 20 percent of the income distribution in New Mexico had the lowest earnings replacement, while replacement rates were relatively equitable for the rest of the income distribution.

This was the “state of the science” when the National Academy of Social Insurance and the Upjohn Institute for Employment Research published *Adequacy of Earnings Replacement in Workers' Compen-*

Table 2.1 Ten-Year Earnings Losses and Replacement Rates for PPD Claimants

	NM	WA	CA	WI	OR
Potential earnings (\$)	167,244	250,251	238,262	222,055	197,737
10-year losses (\$)	34,314	41,220	61,767	49,477	39,202
Total benefits (\$)	15,832	16,734	22,612	14,452	16,636
Proportional wage loss (%) ^a	20	16	25	23	20
Pretax wage loss replacement rate (%) ^b	46	41	37	29	42

^aRow 2 / Row 1.

^bRow 3 / Row 2.

SOURCE: Adapted from Reville, Bhattacharya, and Weinstein (2001).

sation Programs (Hunt 2004). A Study Panel on Benefit Adequacy of the National Academy spent several years reviewing conceptual issues and evaluating the empirical work that had been done to that time. The study panel endorsed the wage-loss studies as “the best yardstick to measure the adequacy of benefits” (p. 132). However, “for all categories involving substantial lost time from work or permanent disabilities, aggregate replacement rates are considerably below the two-thirds standard when considered over the 10-year period following the injury” (p. 132).

In addition, the study panel called for additional wage loss studies from other states, especially studies that included TTD claims and studies from states using alternative methods for setting PPD benefits. The hope was that additional studies would provide more guidance to policymakers seeking the most adequate, equitable, and efficient wage replacement policy.

However, we are aware of only three other U.S. studies since the release of the study panel report and recommendations in 2004. Seabury et al. (2014) studied New Mexico workers’ compensation claims with injury dates from 1994 to 2000. This study linked back to the early Berkowitz and Burton study by utilizing federal data from the Internal Revenue Service and Social Security Administration rather than state unemployment insurance data to determine earnings.

Seabury et al. were able to secure actual earnings data for up to 10 years following the injury. But findings were disappointing, as they estimated that only 16 percent of losses were replaced by workers' compensation benefits.

Dworsky et al. (2016) used the same methods as Reville, Bhat-tacharya, and Weinstein (2001) to study trends in earnings losses and workers' compensation benefits paid before, during, and after the "Great Recession" in California. This study, funded by the California Commission on Health and Safety and Workers' Compensation, probes the impacts of the recession during a period that also saw considerable policy changes in benefits for permanently disabled California workers. They found that workers injured during and after the Great Recession of 2008–2009 experienced substantially higher earnings losses than those injured earlier. Impairment ratings and workers' compensation benefits both increased, but the loss replacement rate still decreased because of a shift toward lower wage levels for workers injured during the recession.

The third study was supported by the Workers Compensation Research Institute and is reported in some detail below (Savych and Hunt 2016). Covering Michigan workers injured in 2004 and earnings records through 2008, this study raises questions about the most appropriate measure of earnings losses for workers' compensation policy purposes.

MORE RECENT CANADIAN STUDIES

Tompa, Scott-Marshall, et al. (2010), from the Institute for Work and Health in Toronto, have contributed a more recent Canadian perspective to this body of work. In a path-setting but little-known study for the Workplace Safety and Insurance Board (WSIB) in Ontario, they compared the benefit adequacy of three Canadian compensation regimes: 1) the permanent-impairment regime in place in Ontario before the 1990 reforms, 2) the loss-of-earnings-capacity regime

installed in Ontario by the 1990 reforms, and 3) the bifurcated regime (claimant gets the higher of impairment or loss-of-earnings-capacity benefit) in British Columbia before 2002.

Table 2.2 shows the details of compensation regimes for the three Canadian workers' compensation programs studied by Tompa, Scott-Marshall, et al. (2010). Ontario based compensation on after-tax (or spendable) earnings, with a 90 percent nominal replacement rate. British Columbia used the more traditional 75 percent of preinjury gross (i.e., before-tax) earnings.

Tompa, Scott-Marshall, et al. (2010) also provide a painstaking analysis of the different methodologies for measuring the earnings losses of injured workers. For instance, they explain and illustrate the differences between the "loss replacement rate" and the "earnings replacement rate." The loss replacement rate uses the difference between comparison group earnings and injured worker earnings as the denominator, with workers' compensation benefits paid as the numerator to calculate the rate.

$$\text{Loss replacement rate} = \frac{\text{WC income benefits}}{\text{Comparison earnings} - \text{postinjury earnings}}$$

The earnings replacement rate adds the postinjury earnings of injured workers to the numerator, thereby taking into account the residual earning capacity of injured workers. It then compares this total to the estimated earnings in the absence of injury (comparison earnings). The result is a higher measured replacement rate, which is due to the mathematics, but which also more accurately reflects the fact that most injured workers will return to work and their earnings losses will be temporary. Thus, the earnings replacement rate takes the perspective of the injured worker and his/her income flow rather than the perspective of the workers' compensation system.

$$\text{Earnings replacement rate} = \frac{\text{WC income benefits} + \text{postinjury earnings}}{\text{Comparison earnings}}$$

Table 2.2 Summary of Three Long-Term Disability Compensation Programs

Program	Short-term disability benefit amount ^a	Criteria for long-term disability benefit ^b	Long-term disability benefit amount ^a	Time period for long-term disability benefits	Separate loss of quality of life award paid
Permanent impairment (Ontario, pre-1990)	90% of preaccident, after-tax earnings	Permanent impairment after MMI	$90\% \times$ preaccident, after-tax earnings \times percentage permanent impairment	Benefits paid for life	No
Loss of earnings capacity (Ontario, post-1990)	90% of preaccident, after-tax earnings	12 continuous months on short-term disability benefits	$90\% \times$ after-tax loss of earnings capacity	Benefits received until age 65, followed by pension based on 10% of benefits received	Yes
Bifurcated (British Columbia, pre-2002)	75% of preaccident, before-tax earnings	Permanent impairment after MMI	Higher of: 1) $75\% \times$ preaccident, before-tax earnings \times percentage permanent impairment; OR 2) $75\% \times$ before-tax loss of earnings capacity	Benefits paid for life	No

^aSubject to maximum compensable earnings limit.

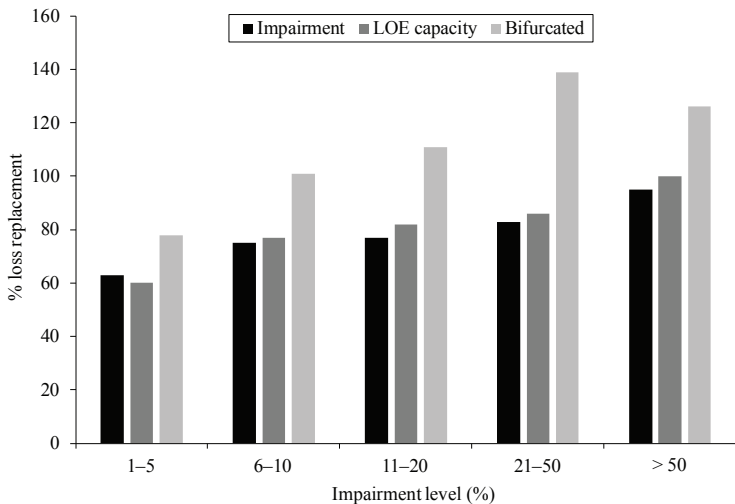
^b“MMI” refers to maximum medical improvement, the conventional time for assessing the level of remaining permanent disability.

SOURCE: Tompa, Scott-Marshall, et al. (2010), Table 1.

Figure 2.1 shows the aggregate after-tax loss replacement rates for the Canadian systems analyzed by Tompa, Scott-Marshall, et al. (2010). These workers' compensation systems replace an average of 60–140 percent of lost earnings, with the bifurcated system yielding considerably higher numbers than the other two (which are quite similar). This should not be surprising: since the bifurcated system gives the higher of the two benefits under the other regimes, it is nearly certain to yield a higher average number than either of the others alone, unless one of them is consistently higher than the other.

Overall, it appears that these Canadian systems replace an average of at least 75–80 percent of after-tax lost wages, except for the low (1–5 percent) impairment group. There also appears to be a tendency for loss replacement rates to increase with severity of impairment in all three systems. The exception is for those with greater than 50 percent impairment in the bifurcated system.

Figure 2.1 Aggregate Loss Replacement Rates

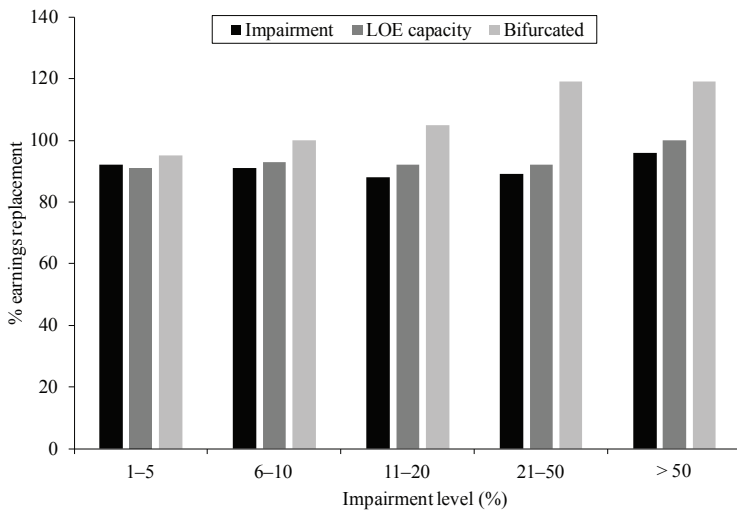


SOURCE: Developed by the authors from Tompa, Scott-Marshall, et al. (2010).

Figure 2.2 compares the postinjury earnings plus workers' compensation benefits paid for each injured worker to the earnings of the uninjured comparison group. It uses this aggregate-level earnings replacement rate as the measure of benefit adequacy. Therefore, benefit adequacy is expressed as the percentage of after-tax lost earnings that are replaced by workers' compensation benefit payments plus workers' estimated earnings for the 10 years following the injury.

Figure 2.2 shows this estimate for the range of impairment levels, from the minor to the very serious. This makes it possible to judge the equity of the benefits paid by the workers' compensation system. It would be desirable for all injured workers to receive the same replacement level of their lost earnings, subject to the impact of benefit caps, which would tend to reduce the replacement rates for higher-earning workers. The Ontario impairment scheme comes very close to achieving that objective, with consistent earnings replacement rates until the

Figure 2.2 Aggregate Earnings Replacement Rates



SOURCE: Developed by the authors from Tompa, Scott-Marshall, et al. (2010).

50 percent impairment level. British Columbia shows more variation by impairment level.

These benefit adequacy rates cannot be precisely compared with the earlier studies in the United States because of the differences in methodology. However, since Tompa, Scott-Marshall, et al. (2010) did report the aggregate-level loss replacement rates for these three workers' compensation regimes, this facilitates rough comparisons with the U.S. studies cited earlier. Table 2.3 shows that for the Ontario pre-1990 impairment rating system, the after-tax aggregate loss replacement rate was 76 percent. For the post-1990 Ontario loss-of-earnings-capacity rating system, the aggregate loss replacement rate was 80 percent; for the British Columbia bifurcated system, the aggregate loss replacement rate was 95 percent. Clearly, all three of these regimes were more generous in replacing lost earnings for injured workers than any of the U.S. states studied to date. Furthermore, all but the 1–5 percent impairment group in British Columbia achieved more than 100 percent aggregate-level after-tax loss replacement rates. Concern about this apparent overcompensation was a major motivating factor in the elimination of the British Columbia bifurcated system of compensation in 2002.

In another commissioned study, Tompa, Mustard, et al. (2010) evaluated the impact of the major revisions to the workers' compensation benefits in British Columbia that took effect in June 2002 (Bill 49). These changes included altering the compensation benefit formula from 75 percent of preaccident, before-tax gross earnings to 90 percent of after-tax net earnings. It also involved moving from the "bifurcated" system of compensating permanent disabilities described earlier to a dominant focus on loss of functional capacity, and a restriction of the cost-of-living adjustment to annual (rather than semiannual) adjustment at 1 percent less than the change in the consumer price index (CPI), with a cap of 4 percent annually (rather than just CPI without a cap).⁴

The research team specifically was asked "to assess the adequacy and equity of benefits provided to claimants under the pre-Bill 49

Table 2.3 Replacement Rates by Impairment Stratum for Losses in Three Canadian Workers' Compensation Programs

Program	Strata (% impairment)	Sample size	Proportion w/ loss (%)	Loss replacement rate (%)	Earnings replacement rate (%)
Permanent-impairment program sample	1-5	3,235	71	63	92
	6-10	3,415	83	75	91
	11-20	3,630	88	77	88
	21-50	1,270	93	83	89
	> 50	145	97	95	96
	Entire sample	11,700	83	76	90
Loss-of-earnings- capacity program sample	1-5	3,005	71	80	91
	6-10	2,750	77	77	93
	11-20	4,225	83	82	92
	21-50	2,755	91	86	92
	> 50	150	97	100	100
	Entire sample	12,885	81	80	92
Bifurcated program sample	1-5	1,670	70	78	95
	6-10	515	79	101	100
	11-20	290	86	111	105
	21-50	125	88	139	119
	> 50	45	89	126	119
	Entire sample	2,645	75	95	99

SOURCE: Tompa, Scott-Marshall, et al. (2010), Table 5.

policy and to assess the impact of Bill 49 changes on benefits for claimants” (Tompa, Mustard, et al. 2010, p. 4). The researchers followed the actual earnings of injured workers for 10 years if their injury was permanent and six years if temporary. They evaluated the impact of these benefit changes by gender, age, geographic location, and severity of functional impairment. They used several alternative analytical methods, as in the Ontario study. They also used actual preinjury earnings to estimate the wage loss for the uninjured state instead of a comparison worker method. Again, all empirical results were reported so that readers could select the measure they found most compelling.

Overall, Bill 49 was estimated to have reduced workers’ compensation benefits in British Columbia by 15 percent. Lesser functional impairment categories had higher earnings recovery, males did better than females, and geography did not appear to matter significantly. The long-term disability sample showed an average estimated aggregate-level after-tax earnings replacement rate of 96 percent. However, for the 50-to-59-year-old group of injured workers, the 90 percent target replacement rate was not reached, either before or after Bill 49. Average aggregate earnings replacement for the 50–59 age group was 78 percent.

The short-term disability sample suffered an estimated average reduction of 9 percent in earnings over six years, but most demographic strata still did achieve 90 percent earnings replacement. Again, the exception was the 50–59-year-old group, which had an aggregate earnings replacement rate of 88 percent.

WORKERS COMPENSATION RESEARCH INSTITUTE STUDY IN MICHIGAN

The Workers Compensation Research Institute (WCRI) and the Upjohn Institute for Employment Research recently collaborated on a study of the workers’ compensation system in Michigan (Savych and

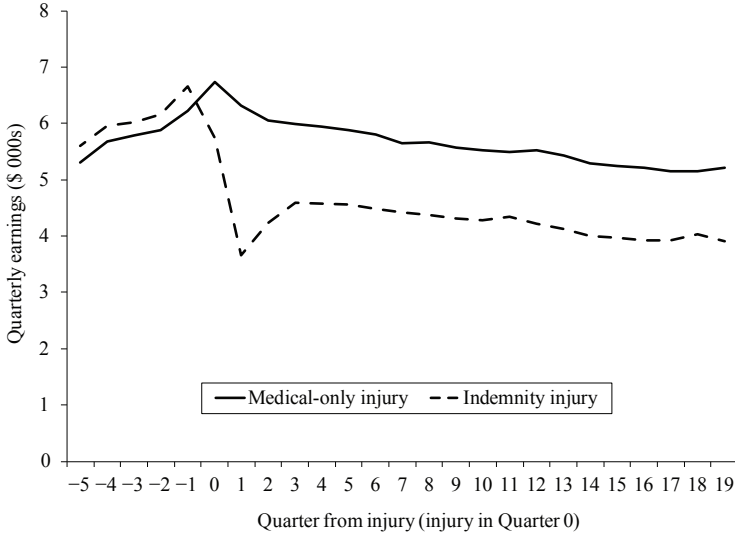
Hunt 2017). The adequacy of workers' compensation benefits, their equity, and their efficacy in promoting return to work were assessed based on a 2004 sample of over 77,000 injured workers evaluated at the end of 2008 (an average of 4.5 years after injury date).

A total of 8,781 Michigan indemnity claims from 2004 with at least one month of lost work time and some wage loss compensation paid were available from the Detailed Benchmark/Evaluation database maintained by WCRI. These claims were matched using propensity-score reweighting procedures against a sample of 63,887 medical-only claims from 2004, which provided the comparison group for estimating what postinjury earnings would have been for the injured workers if they had not been injured.⁵ Quarterly earnings for these claimants from 2003–2008 were obtained from the Michigan Department of Energy, Labor, and Economic Growth. Earnings are observed from 4 to 7 quarters before the injury date and from 16 to 19 quarters following the injury date, depending upon the actual quarter of the injury in 2004. Thus, postinjury earnings and compensation are observed for an average of 4.5 years, ranging from 4 to 5 years, depending upon the specific date of the injury.

Figure 2.3 shows the average earnings for injured workers who receive workers' compensation indemnity payments for at least one month and those who have medical-only injuries. Note that earnings of the comparison group peak in Quarter 0, which is the quarter of the injury. This reflects the requirement that all injured workers must have been working in Quarter 0 or they would not have been covered. Earnings of injured workers peak one quarter before the injury (since no work time is lost in that quarter), decline rapidly in the quarter of injury and the following quarter, and then begin to recover, but not to the level of the comparison group of medical-only injuries. It is the gap between these two earnings lines that represents the wage losses that the workers' compensation system is designed to replace.⁶

For the sample, the average after-tax loss of earnings following the injury is about \$1,000 per quarter. And, as in other wage-loss studies in the United States and Canada, those losses appear to be very

Figure 2.3 Unadjusted Average Quarterly Earnings of Michigan Workers Injured in 2004, by Quarter from Injury and Injury Type



NOTE: Quarterly earnings information covers the period between 2003 and 2008. Sample includes workers injured in Michigan in 2004. Indemnity injury sample includes workers who had more than one month of lost time or received lump-sum payments. Medical-only injury sample includes workers with medical-only injuries. SOURCE: Savych and Hunt (2017).

persistent or even permanent (at least, there is no indication of significant improvement after five years). Because only quarterly earnings data are available, we cannot tell whether the losses are the result of reduced labor force participation, reduced hours of work, or hourly wage reductions.

Because Michigan is a wage-loss state, there is no independent assessment of the degree of permanent impairment for injured workers. All one can do is compare the amount of compensation received from the workers' compensation system to the lost earnings. As a proxy for severity of injury, the number of weeks of wage-loss compensation that are paid to the injured worker is used. An injury that

requires more weeks away from work is probably more serious, but there may be other things that influence the duration of disability payments, so this is not the equivalent of an estimate of residual disability that would be available from an impairment system.

Table 2.4 shows the after-tax earnings replacement rates and loss replacement rates for all injured workers with more than one month of temporary total disability or a lump sum and for subgroups by disability duration. Both the earnings replacement rate for the average observed duration of 4.5 years and the projection of the earnings replacement rate out to 10 years are shown for each group. For the 10-year projections, claim-specific reserves were added to payments already made to estimate the total workers' compensation payments, while wage losses were projected to continue at the level observed at the end of 2008. For all injured workers with more than one month of lost time, the after-tax earnings replacement rate after 4.5 years is 97 percent, and after 10 years we estimate that it is 88 percent. Subgroup earnings replacement rates at 4.5 years vary from 94 to 96 percent for those with temporary disability compensation only, and from 91 to 95 percent at 10 years.

This is a good deal higher than earlier U.S. studies found, but roughly comparable to the Canadian results. This primarily reflects the addition of postinjury earnings to workers' compensation payments when calculating the losses associated with the injuries. These earnings were not included in the same manner with workers' compensation payments in the U.S. studies, but they *were* in the Canadian studies cited. Also, most U.S. studies only included injured workers with permanent partial disabilities, whereas the Michigan study included all injured workers with more than one month of lost work time. It is widely understood that compensation for permanent partial injuries tends to be lower than for temporary injuries in workers' compensation programs. This reflects the disputed elements involved in such injury claims.

Presumably, workers with what are called permanent partial injuries in other states would end up receiving redemption payments

Table 2.4 Earnings Replacement and Loss Replacement Rates for Workers with Indemnity Injuries in Michigan in 2004

Indemnity groups based on duration of temporary disability payments and receipt of lump-sum settlement	Earnings replacement rate (%)		Loss replacement rate (%)	
	at 4.5 years	at 10 years	at 4.5 years	at 10 years
All injured workers with lump sum or > 1 month temporary disability	97	88	87	52
Subgroups of temporary disability duration (no lump sum)				
1–3 months	96	95	40	23
4–6 months	94	91	51	31
7–12 months	96	95	77	59
> 12 months	94	95	89	91
Subgroups with lump-sum settlements				
Lump sum and no TD payments	30	74	57	57
Lump sum and 1–3 months TD	35	85	62	71
Lump sum and 4–12 months TD	49	98	67	97
Lump sum and > 12 months TD	91	155	92	170

NOTE: Claims assessed at between 4 and 5 years after injury. This projects to 10 years based on current earnings and workers' compensation payments at time of assessment plus claim reserves.

SOURCE: Savych and Hunt (2017), Technical Appendix Tables C4a and C4b.

(“lump sum” payments) in Michigan, so it is relevant to examine this group in more detail. For all claims receiving lump-sum payments, the average after-tax earnings replacement rate is 101 percent at 4.5 years (reflecting the impact of the lump-sum payment some time during the first 4.5 years). This falls to 69 percent when projected out to 10 years since the lump-sum payment will close the claim for good and there will be no remaining claim reserves.

The distribution of results for lump-sum claims when including their temporary disability payments indicates that, on average, those receiving some TTD were more adequately compensated. This probably reflects the high level of controversy among lump-sum claims. Those showing no temporary disability payments likely had their claims disputed from the start and therefore ended up with lower compensation overall.

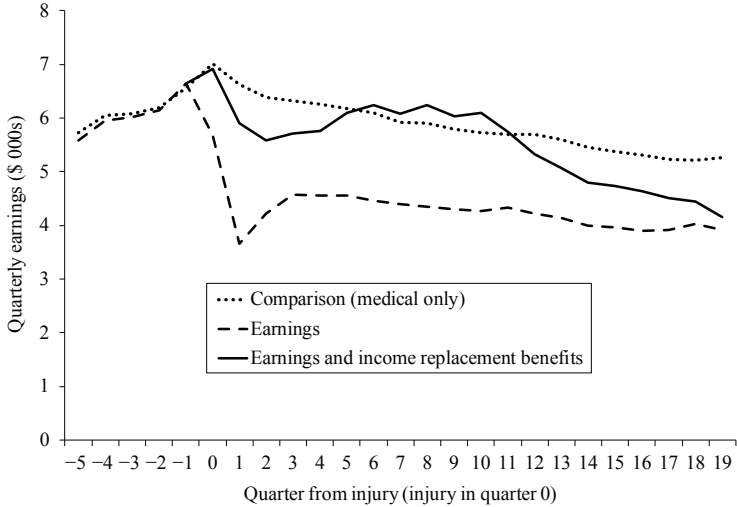
Table 2.4 also reports the loss replacement rates for Michigan workers. As discussed earlier, this is the typical measure of benefit adequacy that has been used in most previous studies. Except for the omission of workers with injuries that received less than one month of TTD, and the fact that all such indemnity claims—not just permanent partial disability claims—were included, these after-tax loss replacement rates should be more comparable with those of other U.S. studies than the earnings replacement rates used in this study.

With one exception, all the loss replacement rates are lower than the earnings replacement rates. The one exception is for claims with more than 12 months of TTD followed by a lump-sum settlement. Presumably, these injured workers at 4.5 years after the injury have recent lump-sum settlements. Note that the projected replacement rates for this group at 10 years are nearly identical for both measures.

It is interesting that the difference between the earnings replacement rate and the loss replacement rate is greatest for the shortest-duration claims. This sustains our belief that it is the “overweighting” of short-term claims that drags the aggregate loss replacement rate down.

Figure 2.4 shows the net effect of the workers’ compensation benefits paid to injured workers in Michigan. The total income from

Figure 2.4 Average Quarterly Earnings, Workers' Compensation Income Replacement Benefits, and Reweighted Comparison Earnings, by Quarter from Injury, Injuries in Michigan in 2004



NOTE: Sample includes workers injured in Michigan in 2004. Indemnity injury sample includes workers who had more than one month of lost time or received lump-sum payments. Comparison-sample quarterly earnings information covers period between 2003 and 2008.

SOURCE: Savych and Hunt (2017).

earnings and income replacement benefits (solid line) falls for two quarters and then begins to rise, and it actually exceeds that of the comparison workers (light dashed line) between 1.5 years and 2.5 years after the injury (Quarters 6 through 10) as lump sums are paid out. However, the total income of the injured workers falls rapidly after these payments are mostly completed, and the shortfall with comparison workers grows significantly after 2.5 years (Quarter 10). It seems clear that the total income from earnings and benefits is headed for convergence with the line for earnings alone five years after the injury, as the vast majority of workers' compensation benefits will have been paid out.

CONCLUSION

It is 30 years since the initial wage-loss study by Berkowitz and Burton (1987) was published, but we continue to struggle toward a better understanding of the adequacy and equity of workers' compensation benefits. While we have wage loss benefit adequacy studies from the states of California, Michigan, New Mexico, Oregon, Washington, and Wisconsin, plus the provinces of British Columbia and Ontario in Canada, it is still difficult to make summary judgments or accurate comparisons across the jurisdictions. There are several reasons for this. First, the workers' compensation systems themselves differ substantially, both in design and in actual application. This has plagued research on workers' compensation systems and limited the generalizability of any findings.

Second, there are small but significant differences in methodology between the studies, which lead to differences in the findings. These differences reflect the specific data available to the researchers, as well as honest differences of opinion about how best to measure benefit adequacy in these complicated social insurance systems.

Third, there are inevitable differences in interpretation of the findings that are derived from these studies. Some of these differences unfortunately will be interpreted as political leanings in this age of political polarization. It would be difficult to expect a social insurance system like workers' compensation to be exempt from political influences or interpretations.

Upon completion of the multiyear Study Panel on Benefit Adequacy at the National Academy of Social Insurance more than a decade ago, the members of the panel called for "additional wage loss studies from different jurisdictions" (Hunt 2004, p. 133). These studies have not been forthcoming. As we have seen, in the past decade there have only been the two Canadian studies, one study in New Mexico, another in California, and the recent study from Michigan. The analytical techniques have certainly been developed and refined,

but there has been little progress in our understanding of what works better in a workers' compensation system and why. It appears to us at this time that there is insufficient interest in the answer to the question, "Are workers' compensation benefits adequate and equitable?" It is possible that recent discussions, prompted by a series of articles published in *ProPublica* (e.g., Grabell and Berkes 2015a,b), may raise the interest sufficiently to start a movement in this direction.

Our review indicates that the Michigan wage-loss workers' compensation system seems to provide better benefit adequacy than other U.S. systems that use the impairment method of compensation. But Michigan's is not as good as some Canadian systems for injured workers. Unfortunately, we cannot discern whether this is due to the wage-loss principle upon which the Michigan system is based or some other factor. Theoretically, one would expect a benefit system based on actual wage loss experienced, rather than a medical diagnosis of impairment or an estimate of loss of wage-earning capacity, to yield more accurate earnings replacement results at the individual level. And this does seem to be the case.

The Michigan system appears to be performing as designed, and it also demonstrates increasing replacement rates for more serious injuries, which may represent an element of social welfare thinking. Workers who are more seriously injured, but not seriously enough to qualify for Federal SSDI benefits, may have fewer income maintenance options and may not be able to respond to a financial incentive that promotes return to work.

Short-duration workers' compensation claims show the impact of the waiting period (effectively a copay for injured workers), which suppresses replacement rates for such claims. But such claims also achieve very high return-to-work rates and quickly achieve near parity of earnings with those who did not lose any work time (medical-only claims).

The findings from the Michigan study indicate that taking account of the postinjury earnings of injured workers makes a significant difference in judgments about benefit adequacy. That is, earnings replace-

ment rates are significantly “more adequate” than loss replacement rates for the Michigan system as well as some Canadian provinces.

Furthermore, we believe that this is a preferable way to analyze benefit adequacy, particularly for temporary disabilities, since the societal goal is to return the injured worker to productive employment with minimal disruption. Using earnings replacement rates rather than loss replacement rates reflects this policy focus. It also highlights the distinction between injured workers who need temporary support while they recover from their injuries and those who will likely not recover and need permanent support.

It is difficult to explain what seems to be a permanent drop in earnings among injured workers who file workers’ compensation claims. This has been found in all the wage loss studies to date and confirmed in the WCRI interview studies of worker outcomes (Savych and Thumula 2016). Apparently, injured workers suffer some kind of “separation effect” similar to that of economically displaced workers. This could be due to supply factors such as changed preferences for income and work, or to demand factors such as discrimination by employers against workers’ compensation claimants. This is a subject that clearly deserves more investigation.

Concerns remain about the adequacy of lump-sum redemption payments in Michigan to sustain injured workers over the remainder of their lives, but our analysis shows better outcomes than those previously reported for other U.S. states. However, average earnings replacement rates decline from 95 percent at 4.5 years to 67 percent at 10 years, even with knowledge of the claim reserves held by the workers’ compensation insurers in Michigan.

So are the Michigan workers’ compensation benefits adequate? That perception still remains largely in the eye of the beholder. The finding that both earnings replacement rates and loss replacement rates are higher in Michigan than in other U.S. states that have been studied is encouraging, and it raises questions about the unique aspects of the Michigan system. Are wage-loss systems inherently superior in replacing lost earnings? Or is this finding due to the specific method-

ology adopted for this study? Only more such studies of other states with different methodologies can tell us. We sincerely hope that such studies will be forthcoming in the near future.

Notes

1. See the extensive discussion of the issue of adequacy in Hunt (2004), Chapter 2.
2. However, there are also five states (including Michigan) that use a formula based on spendable earnings, which is gross earnings less estimated taxes based on family size, and seven states that use some other percentage of gross earnings (three at 60 percent, three at 70 percent, and one at 72 percent). See WCRI (2014), Table 4.
3. Contested cases are those in which the employer or insurer disputes either the work-relatedness or the level of the disability. These cases generally require an administrative hearing and usually feature legal counsel for both sides. Disputed cases usually involve more severe disabilities and are considerably more expensive.
4. Loss of earnings benefits were still available in circumstances that were “so exceptional” as to create undue hardship under the loss-of-functional-capacity evaluation method.
5. This sample represents about one quarter of the indemnity claims in Michigan. See WCRI (2014) for discussion of the representativeness of the Michigan Detailed Benchmark/Evaluation sample.
6. This is not strictly correct, since the Michigan workers’ compensation system uses a benefit formula that aims to replace 80 percent of pre-injury spendable earnings, subject to a maximum benefit at 90 percent of the state average weekly wage. Thus, the system uses the preinjury wage as the standard and does not aim to replace 100 percent of lost earnings. However, since the adoption of the comparison-worker analytical model to estimate lost earnings after the injury, it has become routine to think of the gap between the postinjury earnings of injured workers and the comparison group as the target for the system.

Chapter 3

The Challenge of Return to Work in Workers' Compensation Programs

Among the many goals of workers' compensation programs (prevention, compensation, rehabilitation, etc.), the most recent to emerge into public policy concern has been the goal of return to work (RTW), which can be regarded as the ultimate objective of medical care and rehabilitation services after disability resulting from an industrial injury or illness. One could argue that this is the best measure of the value of the social systems that deal with work-related disability—namely, restoring the person to the previous status quo. Preventing injuries and illness is paramount; compensating the individuals adequately while healing and rehabilitation take place is critical; but a return to gainful employment has the potential to allow the injured worker to resume her/his productivity and quality of life.

For most of the first century of workers' compensation programs in the United States, the RTW goal was either left to the parties themselves or managed by the system of vocational rehabilitation that was also included within these statutory programs. Trained vocational rehabilitation professionals evaluated the level of impairment, designed programs for rehabilitation, and assisted injured workers back to gainful employment. However, the length of treatment and the outcomes achieved were frequently not found sufficient to justify the cost, and many workers' compensation agencies have moved away from dependence on formal systems of vocational rehabilitation (Gardner 1985).

As health care costs rose in an increasingly challenging business climate in the 1980s and 1990s, greater emphasis was placed by employers on gaining control of the process after injury and illness claims occurred. This chapter will explore research findings and

policy initiatives that address the return-to-work goal explicitly. It will highlight early research efforts at the Upjohn Institute that helped to document the potential of disability prevention and management through analysis of survey data on workers' compensation claims in Michigan.¹ And it will provide several examples of state workers' compensation policy initiatives that have developed to support the return-to-work goal.

DETERMINANTS OF RETURN TO WORK

Clearly, the determinants of return to work are multidimensional; they include medical treatment, rehabilitative services, employer policies, injured worker characteristics, job requirements, and many other factors. The failure to achieve the return-to-work goal arises from the multiplicity of these contributing causes for disability, perhaps compounded by a general excess supply of labor, which can influence employer behavior in hiring and retention decisions.²

Obviously, there are important medical issues, such as the type and severity of the injury, resulting functional impairments and possible comorbidities, timely access to effective treatment and rehabilitation, and many others, that will influence the recovery as well as what kind of work can be performed after a work injury or illness. In addition, personal factors of the injured worker come into play. Beyond the possibility of impaired work skills and productivity, there are family circumstances and social influences, including the attitudes and beliefs of fellow workers, the workplace culture, and the very real fear of potential reinjury.

There are also institutional determinants impacting RTW, such as employer policies and practices, workers' compensation disputes and settlements, insurer behavior, and labor relations. Labor market dynamics also play a role when an excess supply of labor creates highly competitive conditions in the labor market, or when deficient demand due to recession reduces the chance of finding an alterna-

tive job. The employer-at-injury may have suffered business reverses, leaving the injured worker with limited alternative work options, or left out completely and subject to the vagaries of the general labor market.

There are also policy causes of failure to return to work. One possibility is that an injured worker might qualify, or think she/he will qualify, for social insurance benefits other than workers' compensation. This could make returning to work to meet financial obligations seem unnecessary, or a less appealing alternative. The largest disability compensation program in the United States is the Social Security Disability Insurance (SSDI) program, administered by the Social Security Administration and funded by the Old Age, Survivors, and Disability Insurance (OASDI) payroll tax system. Theoretically, there should be very little overlap between workers' compensation and SSDI populations because the severity of disability required to qualify for SSDI is very high (disability expected to last more than one year or result in death). This would rule out all but the most severely disabled of workers' compensation claimants (less than 2 percent of the total).

O'Leary et al. (2012) estimate that 7 percent of new SSDI awards in the state of New Mexico result from workers' compensation-covered injuries or diseases. Strikingly, the impact of a compensable lost-time injury on the likelihood of SSDI receipt some years later is about the same as aging by 10 years (p. 12). Assuming that these empirical estimates from New Mexico are representative of the nation as a whole, there would be as many as 70,000 new SSDI awards to former workers' compensation beneficiaries every year. So the relative magnitudes suggest that transitioning to SSDI may be fairly common for seriously disabled workers' compensation claimants.³

However, a full understanding of the requirements for SSDI eligibility is not widespread, so injured workers may believe they qualify for benefits when they actually do not. The exact line between meeting and not meeting the requirements in the SSDI disability listings can be somewhat mystifying, leading to considerable uncertainty

about who will qualify and to pervasive legal representation and administrative litigation. Standards also appear to vary somewhat in their application in different states, as it is a state government agency that makes the initial determination as to which cases are eligible.⁴ Thus, seriously injured workers who have used up their workers' compensation benefits or private disability benefits, or who expect to do so, may mistakenly regard SSDI as a potential alternative or supplement to workers' compensation benefits for work-related injuries and illnesses.⁵

Disabled workers who become impoverished may also be eligible for state and local welfare assistance and/or federal Supplemental Security Income (SSI) benefits. So while there are a variety of sources of income for work-injured employees, none of them provide full earnings replacement or the typical package of benefits that accompany most full-time jobs. Still, they should be considered a significant policy factor affecting RTW outcomes for workers' compensation programs.

Likely the biggest barriers to RTW are the private decisions made by employers and employees in our employment-at-will labor markets. Employers may decide that they do not want to employ an injured individual any longer. If the ADA or other antidiscrimination statute does not come into play, that is their right. Employees may decide that they would prefer not to return to their at-injury job. No doubt both of these decisions are very common. The fact that they have not been studied sufficiently reflects the difficulties involved in researching such private and multidimensional decisions rather than a lack of public interest.⁶

The magnitude of the RTW problem has been quantified by a unique series of interview studies of injured workers. The Workers Compensation Research Institute (WCRI) conducted studies of completed samples of about 400 workers in each of 15 states (Arizona, Connecticut, Florida, Georgia, Indiana, Iowa, Kentucky, Massachusetts, Michigan, Minnesota, North Carolina, Pennsylvania, Tennessee, Virginia, and Wisconsin) over the period 2013–2015. All of these

injured workers missed at least seven days of work because of their injury. They were interviewed by telephone between 2.8 and 3.0 years after their injury. Table 3.1 shows the range of RTW results among the 15 states, but more significantly the high proportion who were not working about three years later “predominantly due to the injury.” Those who were not working at the time of the interview ranged from 11 to 19 percent, and those who had never returned to work for more than 30 days since the injury ranged from 9 to 19 percent. These numbers are concerning. In addition, from 6 to 11 percent of those who had returned to work reported that they were earning “a lot less” than before the injury, which further demonstrates the magnitude of labor market problems encountered by injured workers.⁷

Last, among those who had returned to work “successfully,” meaning for at least 30 days, between 19 and 37 percent had different job duties with the at-injury employer predominantly because of the injury, and between 2 and 10 percent had a new employer because of the injury (Savych and Thumula 2016).

While these are somewhat subjective measures gleaned from an interview study, they indicate the degree of labor market disruption created by a compensable injury in a typical state. Adding those who reported that they earned a lot less to those who were no longer working, we get a figure of 18 to 27 percent of workers’ compensation wage-loss claimants who were still suffering significant economic loss nearly three years after their injury, the major cause for this being lack of employment. It is worth noting that these results are roughly comparable to those for dislocated workers whose employers have closed completely (Jacobson, LaLonde, and Sullivan 1993).

The Emergence of Disability Management as an RTW Solution

During the 1980s and 1990s, largely in response to the spiraling costs of workers’ compensation insurance, larger corporate employers began to adopt techniques that came to be collectively known as “disability management.” Disability management refers to the set of

Table 3.1 Return-to-Work Performance in 15 States

	AR	CT	FL	GA	IN	IA	KY	MA	MI	MN	NC	PA	TN	VA	WI
% not working three years after injury, predominantly because of the work injury	16	15	14	17	11	13	17	17	12	12	19	17	16	13	12
% who never returned to work for 30 days within three years after the work injury	15	12	14	19	9	14	18	14	9	11	15	15	15	13	10
% working at interview who reported earning “a lot less” because of the injury	8	8	11	8	8	9	7	9	7	11	8	8	8	7	6

NOTE: Based on samples of about 400 workers in each of 15 states. Telephone interviews were conducted from 29 to 40 months after a compensable injury involving at least seven days of lost work time. State response rates ranged from 25 to 31 percent, and the interviews were conducted in three phases—eight states in 2013, four states in 2014, and three states in 2015.

SOURCE: Savych and Thumula (2016), Tables 3.2 and 3.5.

practices designed to minimize the disabling impact of injuries and health conditions that arise during the course of employment. This includes better medical management, more accommodation of existing limitations, and other such efforts to prevent work disability.

Disability management is not the same as accident prevention, but rather is broadly focused on preventing the development of work disability that can follow an initial injury or disease, or on ameliorating the effects of such disability. This might include changing hours of work, altering work assignments, redesigning specific work tasks, or other accommodations that make it possible for the impaired individual to return to work despite his or her impairment. Disability management is also much broader than just return-to-work techniques, but it includes all of those policies and practices that are designed to minimize the impact of disability in the workforce.

Disability Management, the classic work by Akabas, Gates, and Galvin (1992), provided the following definition: “Disability management is a workplace prevention and remediation strategy that seeks to prevent disability from occurring or, lacking that, to intervene early following the onset of disability, using coordinated, cost-conscious, quality rehabilitation service that reflects an organizational commitment to continued employment of those experiencing functional work limitations” (p. 2).

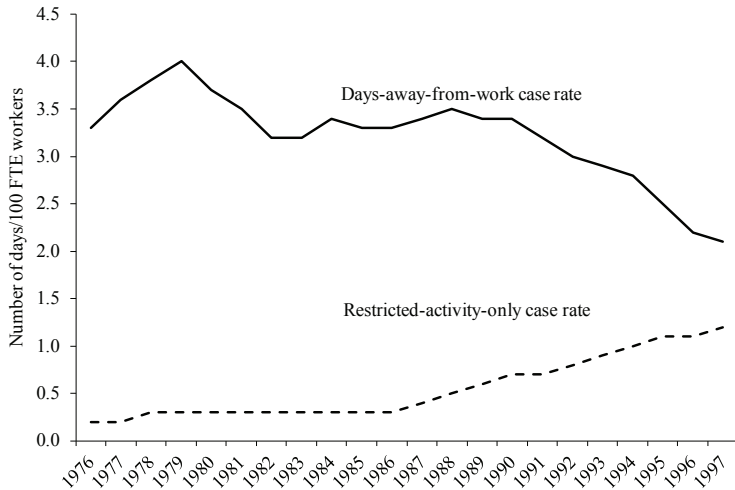
Disability management is time-specific, because it relates to an individual during a particular period of time, and it is employer based, because employers generally control the conditions of employment. Workers’ compensation insurers also practice disability management as a method of loss control and service to their employer clients.

Disability management supports a win-win philosophy, which can result in substantial benefits for both employer and employee. The injured worker returns to employment sooner and suffers less loss of earnings, as well as very possibly a lower likelihood of permanent disability. The employer gets less production interruption, lower costs of replacement labor, and likely lower workers’ compensation costs due to less time off work, resulting in lower benefit payments.⁸

Figure 3.1 shows the decline in injuries and diseases with days away from work and the commensurate increase in days of restricted work activity, as measured by the Bureau of Labor Statistics (BLS) Survey of Occupational Injuries and Illnesses (SOII). These trends appear to reflect the spread of disability management in U.S. private industry. In the context of a rapidly declining OSHA-reported injury rate, the number of cases with days away from work as a result of injury or disease has declined continuously since the late 1980s.

The incidence rate of lost-workday cases has declined by more than 50 percent since 1985. Yet the number of restricted-work cases increased at least through 2000, ultimately approaching 42 percent of the number of cases with days away from work (Ruser and Wiatrowski 2013). While there is no direct measurement of the effect, it seems likely that an increasing percentage of all OSHA-recordable

Figure 3.1 National Trends in Rates Associated with Lost Workdays (rates per 100 full-time-equivalent workers), Private Industry, 1976–1997



SOURCE: Ruser (1999).

cases in the U.S. private sector may be experiencing some application of disability management aimed at reducing days away from work, and this is manifested in the rising proportion of restricted-work cases.

Upjohn Institute Research on Impacts of Disability Management

The Upjohn Institute began work on these issues under two research contracts with the Michigan Department of Labor, beginning in 1987 and ending in 1993. The first project, funded by the Michigan Bureau of Workers' Disability Compensation, sought to explain the wide differences among employers in claim rates for workers' compensation benefits. Analyzing administrative data that showed variation of more than tenfold in workers' compensation claim rates, it was found that these differences were only partially explained by industry, size of firm, and location (only about 25 percent of the variance was explained by these factors). Also, high-claim firms had twice as many accidents but four times as many workers' compensation claims (Hunt 1988). This raised the question of whether there were differences in policies and practices of employers that might explain the differences in performance, and this policy and practice dimension was probed in a second study with sponsorship from the Bureau of Safety and Regulation of the Michigan Department of Labor.

The Michigan Disability Prevention Study was a collaborative effort between the Upjohn Institute, Michigan State University, and the Bureau of Safety and Regulation (Hunt et al. 1993).⁹ A mail survey (which achieved a 46 percent response rate) of a random sample of 220 Michigan establishments with more than 100 employees from seven industry groups (Food Production SIC 20, Furniture Manufacturing SIC 25, Rubber and Plastics SIC 30, Fabricated Metals SIC 34, Nonelectrical Machinery SIC 35, Transportation Equipment SIC 37, and Health Services SIC 80) was conducted in 1991. The research team had access to the administrative records for workers' compensation claims for these firms as well.

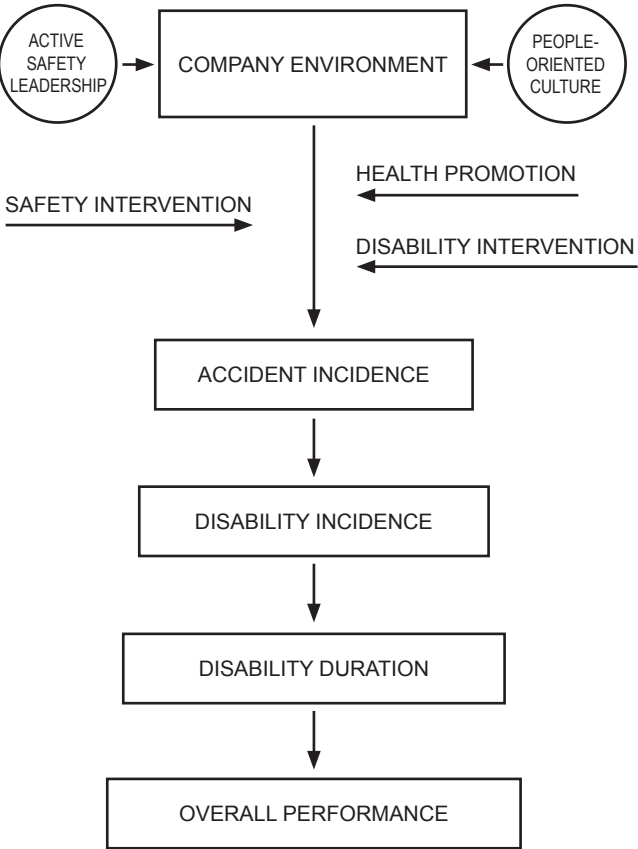
Figure 3.2 displays the conceptual model that guided the project. The model sees the company environment as being determined by dimensions like “people-oriented culture” and “safety leadership” and mediated by policies of health promotion, safety intervention, and disability management techniques. The result is a specific level of disability prevention and management performance, as measured by accident incidence, disability incidence, and disability duration (Hunt et al. 1993, Fig. 1).

The study correlated differences in self-reported achievement of relevant policy and practice dimensions with firm performance on disability outcome measures. The policy and practice dimensions were developed from an intensive literature search, with review and refinement by a group of expert advisers. From a total of 228 relevant concepts identified in the literature, 139 were selected for possible scale development. After pilot testing and further expert consultation, a total of 95 items in eight scales (determined through factor analysis) were incorporated in the Organizational Policies and Practices (OPP) survey instrument (Habeck, Hunt, and VanTol 1998). The eight scales were labeled 1) People-Oriented Culture, 2) Active Safety Leadership, 3) Safety Diligence, 4) Safety Training, 5) Disability Case Monitoring, 6) Proactive RTW Program, 7) Wellness Orientation, and 8) Ergonomic Solutions.¹⁰

Variation in firm self-reported achievement of these policy and practice dimensions was correlated with outcome measures, including the OSHA recordable incident rate per 100 employees, the lost workday case rate per 100 employees, the workers’ compensation wage-loss claim rate per 100 employees, and the total lost workdays per 100 employees (Habeck, Hunt, and VanTol 1998).

Three multivariate models were estimated reflecting the underlying conceptual model. The Prevention Model estimated the effect of *preinjury policies and practices* in reducing the frequency, severity, and duration of disability resulting from work-related injuries and diseases. The Disability Management Model estimated the role of *policies and practices that occur after the injury* in reducing the

Figure 3.2 Conceptual Model of Disability Prevention among Michigan Employers



SOURCE: Hunt et al. (1993).

occurrence, the severity, and the duration of disability. The Managerial Model estimated the influence of the *specific elements of the company environment* on their injury and disability experience.

In each case, the measures were scaled, so the effect of a 10 percent difference in an independent variable (policy and practice) was expressed in the percentage difference in each dependent variable (disability outcome). The multivariate regression estimates also controlled for structural variables like employment level of the firm, multiple-site firms, union presence, self-insurance, and wage level.

The significance of this early study was in its analytical and design rigor combined with simplicity in presentation. It was not difficult for employers to understand that 10 percent better performance in *Safety Diligence* was associated with a 6.6 percent lower incidence of OSHA recordables and a 16.6 percent lower level of lost workday cases (Habeck, Hunt, and VanTol 1998). In fact, this study led to great interest from employers who wanted to improve their performance on disability prevention and lower their workers' compensation costs. Extensive outreach efforts were conducted by the research team and by the Michigan Bureau of Safety and Regulation.

Overall, the empirical results confirmed that employer policy and practice dimensions like People-Oriented Culture, Active Safety Leadership, Safety Training, Safety Diligence, Disability Case Monitoring, and Proactive Return to Work were very effective in explaining differences among Michigan firms in the incidence of lost workday cases, workers' compensation claims, and total lost workdays. And while this was a cross-sectional study of different firms at a particular point in time, findings were widely interpreted as indicating that these policy and practice dimensions offered firms the opportunity to improve their performance through time.

Research has continued using the organizational policies and practices scale (OPP), developed in the Michigan study, and derivatives of that scale. Ben Amick at the Institute for Work and Health (IWH), located in Toronto, Ontario, conducted a study of 198 workers with carpal-tunnel-release surgery claims in Maine (Amick et al.

2000). Other studies include a study of 65 manager-worker pairs in Ontario (Ossman et al. 2005) and a study of 188 health care workplaces in Ontario (Williams et al. 2007). The results of these additional studies have strongly confirmed the relationship between the OPP variables and workplace outcomes.

Subsequently, an abbreviated version of the organizational policies and practices survey was incorporated into the Ontario Leading Indicators Project (OLIP), which has been used to survey over 2,000 workplaces in Ontario since 2011. More recently, an even more abbreviated version of the OPP was field tested by the Workers' Compensation Board of the Province of New Brunswick (WorkSafeNB). After a study of about 250 employers, WorkSafeNB adopted the tool to use in its Focus Firm program, which targets firms with high workers' compensation claim frequency for their industry. So the practical usefulness of the research concepts has been confirmed in their adoption by public agencies as well as private employers.

Other Empirical Research on Return to Work

With funding from the California Commission on Health and Safety and Workers' Compensation (CHSWC), the RAND Institute for Civil Justice has conducted several major studies of workers' compensation, including the return-to-work dimension. In a working paper, McLaren, Reville, and Seabury (2010) reported the estimated difference in the number of weeks before return to work between large firms with a return-to-work program and those without such a program.

They found four major return-to-work techniques in use by their sample firms: 1) modified work tasks, 2) modified work station or equipment, 3) reduced work time and schedule changes, and 4) transfer to a different job. The results, based on a nonrandom survey of 40 large, self-insured employers in California in the year 2000, are shown in Table 3.2. These firms reported huge impacts of disability management programs, in the range of 40 percent shorter median

Table 3.2 Estimated Improvements in Weeks before RTW

	All workers		PPD claims	
	No fixed effects	Fixed effects	No fixed effects	Fixed effects
Weeks to RTW	9.0	8.9	39.7	35.5
without program	(41.1)	(40.8)	(69.5)	(65.2)
Difference <i>with</i>	-3.8	-3.6	-18.8	-12.6
program	(-15.7)	(-15.1)	(-25.9)	(-17.6)
Median change (%)	-42.2	-40.4	-47.4	-35.5
Mean change (%)	-38.2	-37.0	-37.3	-27.0

NOTE: Columns show median number of weeks (means in parentheses).

SOURCE: Adapted from McLaren, Reville, and Seabury (2010).

durations with a RTW program in place (columns 1 and 2). This result held for all injuries as well as for permanent partial disability (PPD) cases. The mean differences were almost as large, which is surprising since long-duration claims would seem to be less amenable to disability management treatments.

Using statistical models to control for characteristics of the employer (columns 2 and 4) reduced the size of these effects somewhat, but very large differences remain. According to the authors, “Our findings suggest that return to work programs are highly effective when adopted at large, self-insured firms. . . . Future work should study how return to work programs can be implemented effectively at small firms” (McLaren, Reville, and Seabury 2010, p. S-7).

Franche et al. (2005) at the IWH conducted a systematic review of the quantitative literature on workplace-based return-to-work interventions covering published literature from 1990 through 2003. They identified more than 4,000 papers in English and French published during the period. A total of 35 studies were deemed quantitative in nature, and 10 of these studies, producing a total of 23 scholarly publications, met their quality appraisal criteria.¹¹ Four of the studies came from Canada (from three different provinces), three from the United States (three different states), and one each from Finland, the Netherlands, and Sweden.

Data were extracted from these 10 studies and subjected to evidence synthesis analysis.

Three key quantitative outcome dimensions were used to assess the impact of disability management activities: 1) work disability duration, 2) associated costs, and 3) quality-of-life outcomes. The disability management activities included early contact with the worker, work accommodation offer, contact with a health-care provider, ergonomic visits to the work site, replacement staffing, and RTW coordination. Findings were summarized as follows: “There was strong evidence that work disability duration is significantly reduced by work accommodation offers and contact between healthcare provider and workplace; and moderate evidence that it is reduced by interventions which include early contact with the worker by the workplace, ergonomic work site visits, and presence of RTW coordinator” (Franche et al. 2005, p. 623).

Table 3.3 shows the distribution of disability management interventions and outcomes. It seems that effects of disability management on quality of life of the injured worker are not strong. However, all other activities garner at least moderate evidence of impact on work disability duration and the costs associated with work disability. This constitutes a strong empirical validation of employer benefits from disability management techniques. Similar positive results have been reported in other survey articles, including Tompa et al. (2008) and van Oostrom et al. (2009).

Table 3.3 Effect of Return-to-Work Programs on Duration of Work Disability

Intervention component	Effect on disability duration	Cost	Effect on quality of life
Early contact by the workplace	Moderate	Moderate	Mixed
Work accommodation offer	Strong	Moderate	Mixed
Contact with health provider	Strong	Moderate	Mixed
Ergonomic work site visit	Moderate	Moderate	Mixed
Presence of RTW coordinator	Moderate	Moderate	Insufficient

SOURCE: Adapted from Franche et al. (2005), p. 623.

Another approach is represented by a recent set of studies from the Stay-at-Work/Return-to-Work Policy Collaborative between Mathematica Policy Research (MPR) and the Office of Disability Employment Policy (ODEP) of the U.S. Department of Labor (Bardos et al. 2015). MPR simulated the private and public costs and benefits of returning a disabled worker to the job versus replacing that worker. In such a comparison, it is clear that both the disabled worker and the federal government will experience substantial financial gains over the worker's remaining working life if the disabled worker can be returned to work. The employer's financial return depends critically on the productivity comparison between the disabled worker and the replacement worker.

In their conclusion, Bardos, Burak, and Ben-Shalom (2015) raise the possibility of the government providing federal subsidies for lost productivity due to disability. They believe this is likely to be more effective than subsidizing the rather minimal costs of workplace accommodations in promoting RTW.¹²

Based upon our own experience, we believe it is clear that disability management can prevent or reduce the duration of many workers' compensation claims. It also seems clear that larger employers with generous benefit packages find that disability management programs further the interests of both the firm and its employees. What may not yet be clear is whether these techniques can be effectively applied in smaller firms with more modest benefit packages and fewer administrative resources.¹³ However, as will be shown in the next section, policymakers in several states have been convinced that promoting return to work is in the public interest, and they have proven to be highly innovative in designing approaches to encourage RTW programs.

Public Policy Measures to Promote Return to Work

Because of the perceived payoff to disability management techniques and return-to-work programs, especially among larger, self-

insured employers, several workers' compensation jurisdictions in the United States have sought to promote such programs with public policy initiatives.¹⁴ We will review several of these in some detail, but a brief overview is useful first. These policies have fallen into one or more of the following approaches:¹⁵

Medical Management–Based Methods

Medical management–based methods seek to improve the medical management of work injuries with the objective of reducing lost-time, residual-disability, and employer costs. One successful example is the Washington Department of Labor and Industries program called Centers of Occupational Health and Education (COHE). This began as an experiment in two areas of the state and has proven sufficiently successful to have been expanded to the entire state by the 2011 legislative reforms to the workers' compensation system. COHE is an attempt to increase the availability of specialized occupational medicine personnel and provide priority medical treatment to injured workers. A full-scale evaluation of the program at the two pilot sites, published in 2011, found that injured workers who were treated by health care providers affiliated with a COHE lost 20 percent fewer days from work. COHE treatment was found to reduce total medical and disability costs by \$510 per claim in the first year after the injury (Wickizer et al. 2011).

With more recent expansions from two to four and then to six COHEs, performance has slipped only slightly. According to an April 24, 2014, briefing, the statistics show a 4.1 day reduction in time loss per claim, and savings of \$480 in the first year. The projected ultimate savings per COHE claim are approximately \$1,600 (Washington State Department of Labor and Industries 2014b).

Methods based on medical management also include treatment guidelines for specific conditions and attempts to improve information and communication among medical professionals, insurers, employers, and injured workers and their representatives.

Incentive-Based Methods

Incentive-based methods attempt to provide monetary incentives for employers or workers to minimize the time lost from work. The most striking adoption of this method was in California, which in 2004 established separate tiers of wage-replacement benefits for permanent disability claims, depending upon whether the at-injury employer made a qualifying employment offer to the injured worker. If the employer made such an offer, and the injured worker declined to accept the offer, weekly benefits would be reduced by 15 percent. If no qualifying job offer was made by the employer, weekly benefits would be increased by 15 percent (California Department of Industrial Relations 2014).

Another approach to incentives is illustrated by the Oregon Employer-at-Injury Program (EAIP). Employers are offered a wage subsidy of up to 50 percent for two months if they take an injured worker back under modified work provisions. There is also the possibility of a subsidy to offset the cost of job or work-site modifications required to make such an offer. In addition, when workers are not able to return to their jobs in the short term but have permanent work restrictions, another program called the Preferred Worker Program (PWP) can provide a 50 percent wage subsidy for up to six months and exemptions from workers' compensation premiums for that worker for three years (Oregon Department of Consumer and Business Services 2015).

Accommodation-Based Methods

Particularly since the passage of the Americans with Disabilities Act (ADA) in 1990, which requires accommodation of disabilities by any employer with more than 15 employees unless it causes "undue hardship" for the employer, accommodation has become much more common, including among disability management programs for workers' compensation.

Accommodation to promote employment or return to work for injured workers can encompass reduction in hours, change in work assignment, job rotation, specific job modifications, and other similar methods that promise to improve the worker's fit with the demands of employment. Since full implementation of the ADA in 1992, failure to accommodate a disability leaves the employer open to a potential civil lawsuit with treble damages, unless accommodating the disability will cause undue hardship for the employer.

The ADA prevents employers from discriminating against current or prospective employees based on disability, in cases where "disability" means one of the following three things:

- 1) A physical or mental impairment that substantially limits a major life activity
- 2) A record of such an impairment (which might include a workers' compensation claim)
- 3) Being regarded as having such an impairment¹⁶

It seems clear that many compensable workers' compensation injuries would give rise to a disability under the ADA definition, but certainly not all claims would. Generally, workers' compensation claims that are designated as permanent partial or permanent total disability claims would probably all potentially be subject to the ADA (Flynn and Bruyere 2001).

But the legal mandate for accommodation under the ADA should not divert attention from the return-to-work potential and cost-saving improvements that drive the disability management movement. It should concentrate rather than divert the employer's attention in dealing with work-related disability. We fear that the employer could become concerned with building a record that will withstand legal scrutiny under the ADA rather than trying to maximize the productivity of the injured worker for successful and mutually beneficial RTW outcomes.

Productivity-Based Methods

There is also another approach that has been associated with vocational rehabilitation: providing the injured worker with training sufficient to support a new occupation in which any residual impairment will be less of an issue. This can be thought of as a “supply side” approach to accommodating work disability. Workers’ compensation programs have supported this vocational rehabilitation approach to a greater or lesser extent over the years. However, as in workforce development programs, the quicker and less expensive job placement approach based on existing transferable skills has become dominant. This approach can be expected to lead to lower wages on average, even if the injured worker can be returned to the original at-injury employer. Training is needed to effectively rehabilitate injured workers.

However, it is clear that encouraging employer-based disability management and RTW is now preferred public policy in many states. Whether through economic incentives or government mandate, asking the “job creators” to find ways to work around individual impairments and restore injured workers to employment is now the “state of the art.” But there is a wide range of policy devices for encouraging such practices among employers, and we will review some of the most noteworthy examples here, beginning with the pathbreaking policies in Oregon.

Some Examples of State Policy Initiatives to Encourage Return to Work

To determine how prevalent employer-based return-to-work programs are in workers’ compensation programs, the Upjohn Institute used LexisNexis to survey legislative enactments or administrative rules that mandated or supported such return-to-work programs. We found a multiplicity of approaches that explicitly support private-sector employers in efforts to get injured workers back on the job

after a compensable injury or disease. Some real-world examples are illuminating.

Oregon

Oregon was the first program to directly incentivize employers to take injured workers back. Beginning in 1987, under pressure to reduce the costs of workers' compensation programs in Oregon, the legislature enacted several measures that dealt with the return-to-work issue. The Preferred Worker Program (PWP) was begun in 1987 to provide wage subsidies, premium exemption, claim cost reimbursement, and accommodation cost support for permanently disabled workers' compensation claimants who were unable to return to their regular jobs because of their injuries. This was accompanied by a scaling back of the traditional vocational assistance program in Oregon. Workers with permanent work-related disabilities receive an identification card that informs prospective employers that the worker is eligible for a possible 50 percent wage subsidy for up to six months, work-site modification expense support, and exemption from workers' compensation premiums on that worker for three years. There is no time limit on claiming PWP benefits in Oregon.

In 1993, the better-known "Employer-at-Injury Program" (EAIP) was added to provide 50 percent wage subsidies for up to three months for employers of disabled employees engaged in light duty or transitional work assignments. Work-site modification and other expenses connected with return to work were also covered. The costs of these programs are paid by the Workers' Benefit Fund, which is supported by joint contributions from workers and employers. The assessment rate has been 3.3 cents per hour since 2013, with half (1.65 cents per hour) coming from the employer and half from the worker. This fund also supports cost-of-living adjustments for long-term permanent total disability claimants (Oregon Department of Consumer and Business Services 2014).

Utilization of these programs has varied with economic conditions through the years. In 2013, the EAIP benefit costs were \$22 million, while the PWP cost was about \$6 million. In 2014, over 25 percent of accepted disabling claims had used one or more of the RTW programs within four years after the claimants' injuries—i.e., since 2010. In 2013, the Oregon Department of Workers' Compensation approved support for 9,085 placements with 2,143 separate employers (Oregon Department of Consumer and Business Services 2015). Oregon also maintains a sophisticated follow-up system that uses quarterly administrative earnings records to compare the earnings of disabled workers against earnings of medical-only claims for 13 quarters (just over three years) after the injury. These statistics make it possible to measure the impact of these programs.

In 2014, for the cohort of accepted disabling claims from 2010, those who used any of the RTW programs were 8 percentage points more likely to be employed than those with similar injuries who did not use the programs. The advantage in wage recovery was even greater, at 14 percentage points. On average, those who used the RTW programs recovered to 100 percent of their preinjury wages, even controlling for statewide upward trends in wages and employment (Oregon Department of Consumer and Business Services 2015).¹⁷

Note that the EAIP is aimed primarily at workers with temporary disabilities, while the PWP is for those with permanent disabilities who still have some work potential. For more severely disabled workers, Oregon still offers its Vocational Assistance Program. This program provides traditional vocational rehabilitation benefits for those who are permanently disabled and unable to achieve reemployment at 80 percent of their previous wage level. In 2013, only 377 workers qualified for these benefits (Oregon Department of Consumer and Business Services 2015).

Washington

Next door to Oregon, Washington legislators adopted the Washington Stay at Work Program in 2011 as part of a negotiated reform package for this exclusive state fund insurance system.¹⁸ For eligible employers, beginning in mid-2012, wage reimbursement of 50 percent of base wages is available for up to 66 days, or a maximum of \$10,000 per claim of light-duty or transitional employment. If it is necessary for the employer to incur any expenses to accommodate the injured worker's unique needs, reimbursement is available for up to \$1,000 for training fees or materials, up to \$2,500 for special tools, and up to \$400 for special clothing required.

More importantly, the Department of Labor and Industries created Early Return to Work teams in local administrative offices around the state. When a time-loss claim exceeds 14 days of benefits, the claim is automatically referred to the Early Return to Work team in the nearest office. The mission of the team is to facilitate communication between injured workers, health care providers, and employers, with the objective of exploring return-to-work options.

While we are not aware of any empirical evaluations of this program as yet, the utilization has grown rapidly in the first two-and-a-half years to involve 3,000 employers, 12,000 injured workers, and \$27 million in reimbursements for 2014. L&I reports that the system savings from the reform package (including Stay at Work) reached \$91 million in 2014, substantially exceeding the original projections (Washington State Department of Labor and Industries 2014a).

New Hampshire

New Hampshire offers a version of the rehiring requirement for injured workers. All employers with five or more full-time employees "shall provide temporary alternative work programs to bring injured employees back to work" (New Hampshire General Court 2016, Chapter Lab 504.04[a]). Furthermore, the rules specify that

transitional “means the duty elements are variable as the employee’s work capacity increases” (Lab 504.04[b]). Employers are required to “develop an outline of each position that details present requirements and essential functions of each job within the organization” (Lab 504.04[d]) and provide the treating physician with the outline and task analysis as soon as possible after the injury (Lab 504.04[f]). Finally, the “employer shall offer a position as approved by the treating physician and the employee shall demonstrate a reasonable effort to comply” (Lab 504.04[g]).

These provisions are supported by “joint loss-management committees” that are required as well. This provision relates to employers of 15 or more employees in the state of New Hampshire. While these committees are primarily concerned with safety and health issues, they are also charged to “assist with the identification and definition of temporary, alternate tasks” in support of the return-to-work objective (New Hampshire General Court 2016, Lab 603.02[i]).

New Mexico

The State of New Mexico has followed a similar if less aggressive approach. Effective in 2013, they imposed a limited rehiring requirement for employers, in which the former employee “is receiving, has received, or is due to receive benefits under the workers’ compensation act.” If the injured worker applies for her/his former job, or a modified similar job, and the employer is hiring, “that employer shall offer to rehire a worker who applies for any job that pays less than the preinjury job, provided that the worker is qualified for the job and that the treating health care provider certifies that the worker is fit to carry out the job offered” (New Mexico Compilation Commission 2013).

Massachusetts

An imaginative program with a very different approach is the Qualified Loss Management Program (QLMP) for assigned risk

(residual market) employers in Massachusetts. In 1990, facing a rapidly expanding residual market for employers who could not secure workers' compensation insurance in the regular voluntary market, the Massachusetts legislature adopted a program for residual market employers that provided premium credits for those adopting disability management techniques. A premium credit (i.e., in advance of performance) of up to 10 percent was offered to employers who would engage a certified consultant to implement a "loss control management" program. Furthermore, this credit could be maintained for up to three years, provided the loss control program continued in effect for the employer. However, the third year only carried 50 percent of the credit, as the goal was to improve employer performance and depopulate the assigned risk pool. Subsequently, based upon the results for the first three years, the program was expanded to a fourth year, with 25 percent of the original credit available in year four. In addition, the maximum premium credit was increased to 15 percent to provide even more incentive for employers.

Most interesting as a program design element, the actual size of the premium credit is determined by the average credit factor assigned to the loss management firm, not the employer's actual performance. Provided the loss management firm certifies full QLMP participation, the performance improvements of *other* firms actually provide the basis for the premium credit. So the system is built upon the assumption that disability management practitioners can replicate their average loss management performance in any firm.

According to an evaluation done in 1999, the program produced immediate and sustained benefits for participating employers. In the first year of the program (September 1990 through August 1991), QLMP participants showed 13 percent more improvement than nonparticipating employers in the loss ratio (ratio of incurred losses to standard premium) at first report (after 18 months of experience). In the second year, the same cohort of employers showed 36 percent improvement, and in the third year, 40 percent improvement over nonparticipating employers.

Furthermore, these results held up through second (30 months of experience) and third report (42 months of experience)—i.e., as claims matured over time (Mahler and Blomstrom 1999, Table 3). So there was clearly an improving result over time for participating employers, which would seem to validate the program design.

This innovative program is still in effect in Massachusetts (see www.wcribma.org for more details), and was subsequently emulated to a greater or lesser degree in workers' compensation systems in West Virginia, New Hampshire, and Missouri.

New York

New York has adopted yet another approach. In 2009, the Workplace Safety Incentive Programs were implemented. These are voluntary programs for employers with annual workers' compensation premiums of at least \$5,000 and an experience rating modification under 1.3. This means they have a payroll of over \$250,000 and a workers' compensation claim frequency that was worse than average, although still not too bad. Such firms can participate in three programs: 1) a Safety Incentive Program, 2) a Drug and Alcohol Prevention Program, and 3) a Return to Work Program.

The program specifications dictate that “an acceptable Return to Work Program facilitates an employee's return to work as soon as medically possible after a job-related injury or illness” (New York State Insurance Fund 2012). All three programs, referred to as “Code Rule 60” programs, reward employers who participate with credits on their workers' compensation policy premiums. The credit is 4 percent the first year, reduced to 2 percent thereafter, and is renewable for three years at a time. It is interesting that the New York State Department of Labor evaluates the application and issues the incentive, which then must be honored by the insurer. Services under the Return to Work Program may be provided by the employer, jointly by the employer and the union, by the union itself, or by an outside provider. Procedures for ensuring the involvement of the injured employee, a

designated representative of the employee, and the treating physician are required (New York State Department of Labor 2016).

Ohio

Another interesting application of disability management principles has been adopted as policy in Ohio, another state with an exclusive fund system. The Health Partnership Program began in 1993. This is a managed care program originally designed to improve medical care for injured workers in Ohio. It has evolved more recently into a full disability management program with extensive support available from the Ohio Bureau of Workers' Compensation (BWC).¹⁹

Ohio's disability management program ("Remain at Work") offers a full range of services, which can be financed with a grant from the Ohio BWC, resulting in a low-cost way for employers to gain control of their future workers' compensation costs. In addition, the Ohio BWC offers a premium discount program ("PDP+"), which offers up to a 30 percent reduction in the employer's workers' compensation premium. It requires the implementation of a 10-step "Safety and Health Business Plan." This plan must reduce the claims frequency and severity for the employer by 15 percent to achieve the maximum premium discount.

Ohio is also rather unusual in publishing a "report card" on managed-care organizations (MCOs) operating in Ohio. The current version reports the following:

- the number of policies assigned to the MCO
- the number of claims in hand at the end of the year
- timing of the first report (average number of days between the date of injury and claim filing with the BWC)
- first-report turnaround efficiency (the number of days from receiving the notice of injury from the employer to the date the claim is filed with the BWC)

- the days absent compared to the statewide average, and the “recent medical” charges (excluding claims in the days-absent measure) compared to the statewide average (Ohio Bureau of Workers’ Compensation 2014)

The Ohio BWC publishes these performance statistics on the MCOs who are operating in the state (currently 16 in number) on their website annually, enabling comparisons by employers shopping for these services.

Unfortunately, an evaluation of this program finds that the addition of a performance bonus payment to the program in 1995, as well as the specific rules around payment of bonuses, partially undermined the intention. In the final analysis, the managed care organizations in Ohio were incentivized to reduce the duration of short-term claims but increase the duration of more serious claims to take them out of the performance measurement (McInerney 2010).

California

The state of California has struggled with both poor adequacy of benefits for injured workers and poor affordability for employers for some time (Boden, Reville, and Biddle 2005). In 2004, the legislature attempted to tackle their perceived problems with a number of provisions, including a substantial reduction in the level of permanent disability benefits. There was also an explicit attempt to improve the return-to-work performance in California.

For employers of at least 50 employees, the statute varies permanent partial disability benefits, depending upon a return-to-work offer. If the employer, within 60 days of the condition becoming permanent and stationary, makes an offer of regular work, modified work, or alternative work for a period of at least 12 months, the permanent partial disability benefit is reduced by 15 percent, regardless of whether the employee accepts or rejects the offer. Contrarily, if the employer does not make such an offer, the permanent partial disability benefit is increased by 15 percent.

This unique “bump-up/bump-down” provision was in effect from 2005 through 2012. However, it was used sparingly because the timing of the “permanent and stationary” decision on the claim made it impractical to administer. In the final analysis, employers and insurers pronounced it “unworkable” (Seabury et al. 2011, pp. 19–20). The provision was repealed in 2013.

For small employers—those with fewer than 50 employees—the legislature created a more traditional return-to-work program. This program provided subsidies for small employers who incurred expenses for work-site modifications, equipment, furniture, tools, or other items necessary to accommodate work restrictions of the injured worker. This program, however, was largely ignored by California employers. According to one source, in the years 2007 and 2008, there were only 36 applications for reimbursement under this program, of which 11 were granted, for a total of less than \$9,000 in expenditures (California Commission on Health and Safety and Workers’ Compensation 2009).

An additional complication in California comes from the Fair Employment and Housing Act, which provides protections for individuals with disabilities that limit a major life activity and applies to employers with more than five employees. While this is a civil rights law and provides potentially unlimited tort damages, including punitive damages, it was likely beginning to have more traction at about the same time that the return-to-work provisions were added to the workers’ compensation law in California (Seabury et al. 2011, pp. 28–30).

Seabury et al. (2011) conclude that changes in the Fair Employment and Housing Act that made it easier for injured workers to file a claim may have played a significant causative role in improving RTW results. It is also possible that medical treatment improvements may have contributed. In addition, they allow that “another possibility is that the improvement was driven endogenously by the problems with the system” (p. 68). Things got so bad in California that employers were forced to pay attention to their spiraling costs of workers’ com-

pensation. One of the responses was likely improved attention to disability management techniques.

CONCLUSION

Unfortunately, there is no consistent measure of return-to-work across all state workers' compensation programs, and there is no definitive source that tells how much performance on this critical dimension may have improved. However, while the OSHA incidence of cases with days away from work has been steadily declining since the late 1980s, the number of restricted-work cases increased steadily from the mid-1980s through at least 2000. So the clear implication is that disability prevention and management programs, which use restricted work and other techniques to reduce time lost from work, have been expanding over the past 30 years. Since their focus is to reduce lost workdays and improve the transition back to work, it is logical to believe that overall performance on return to work has improved, especially if there is evidence that more and more employers are using such programs.

But the WCRI worker outcome surveys as well as the studies of benefit adequacy demonstrate that a significant minority of claimants do not return to work successfully following a compensable injury. In addition, average indemnity cost per lost-time claim has increased rapidly, at 4.8 percent a year from 1995 to 2012 (Antonello 2014). In the absence of substantial increases in benefit rates, which have not been seen during this period, this implies a rising average duration for workers' compensation indemnity claims, referred to by the NCCI as rising "severity."

One possible explanation for this trend has been called "the small potatoes effect." It is unlikely that disability management techniques will have much impact on a really serious injury, as opportunities to accommodate or ameliorate will be minimal, at least until considerable healing has taken place. But less serious injuries allow maximum

scope for such interventions, thereby reducing both the incidence and duration of relatively short-term disabilities. This can cause an increase in the average duration because of the elimination or reduction of the “smaller,” less expensive claims. It is one of the truisms for employers that engage in aggressive disability management that their average measured duration of workers’ compensation claims will likely increase because the less serious injuries are no longer there to be counted. It is also true that the “burden” of claiming is relatively high for minor injuries, making it more attractive to “absorb” such claims with wage continuation, vacation time, employer-sponsored health insurance, or other mechanisms.

The growing capability of employers, especially large employers, to prevent workers’ compensation claims during the last three decades seems obvious. There is some debate about the extent to which such efforts result in improved performance for the worker versus claim suppression and cost savings for the employer (Young et al. 2005). But the picture is clear—many employers are managing their workers’ compensation claims more effectively. Many injured workers are realizing better outcomes as well, especially when the less serious injuries that do not qualify for wage-loss benefits are included. While all states have not rushed in with programs to support these efforts, there is enough legislative activity among the states, and enough diversity in program approach and dimension, to demonstrate that this is an emerging area of workers’ compensation policy as well.

The lessons learned from this experience seem obvious in hindsight. First, it is clear that disability management techniques do have the *potential* to remove many barriers to work and thereby reduce the incidence of lost workdays. This means reduced workers’ compensation costs for the employer, but also improved chances that an injured worker will suffer less wage loss from a shorter period of disability. This likely makes it easier to maintain her/his lifestyle during the period of the disability. Maintaining the connection with work also increases the likelihood of a successful recovery from the injury or disease. Given that the same accommodation and amelioration tech-

niques could be applied to persons with disabilities that did not result from work injury, there could be a bonus for employers in dealing with their responsibilities under the Americans with Disabilities Act as well.²⁰

Second, it is now obvious that the relationship between the at-injury employer and the injured worker is critically important through the healing and recovery process. Once that connection is lost, the worker's chances of returning to work drop precipitously, and the trajectory of lifetime expected earnings is significantly lowered.²¹ There is no practical alternative to basing return-to-work efforts in the employment relationship. Many years of experience with vocational rehabilitation programs show that it is exponentially more difficult and more expensive to achieve an alternative employment placement for individuals who have lost their connection with the original at-injury employer.

Third, while there are some concerns about employers using disability management techniques to discourage or resist legitimate workers' compensation claims, that does not seem a sufficient reason to restrict or prevent the use of such techniques. And the fact that employers using these techniques are able to reduce their workers' compensation costs does not make this a bad deal for workers. In fact, improving return-to-work performance with disability management techniques constitutes a genuine win-win situation for employers and their employees.

Notes

1. We use the term "disability prevention and management" to reference a proactive, employer-based approach to do three things: 1) prevent the occurrence of accidents and work-related disability, 2) provide early intervention services for health and disability risk factors, and 3) foster coordinated administrative and rehabilitative strategies to promote cost-effective restoration and return to work. See Habeck et al. (1991), p. 212.
2. See Baldwin, Conway, and Huang (2009) and Galizzi and Boden (2003) for empirical investigations of some of these causes.

3. See Guo and Burton (2012) for a careful study of the influence of workers' compensation programs on the rate of applications to SSDI.
4. See Coe et al. (2011) for an investigation of state variation in SSDI applications and awards.
5. The relationship between benefit payments from workers' compensation and SSDI depends upon the jurisdiction. By federal law, combined benefits from workers' compensation and SSDI are limited to 80 percent of the preinjury wage level. In 15 states, workers' compensation benefits are reduced or offset, while in 35 states it is the other way around and SSDI benefits are reduced while workers' compensation benefits are maintained.
6. But see Burkhauser, Butler, and Kim (1995) for an early contribution.
7. There was no measurement of voluntary labor force withdrawal, so these figures include all those who chose to quit working or were forced out by their employer. While the respondents did indicate that their labor force status "was predominantly due to the injury," that does not exclude the possibility that the injury caused them to retire early. Whether this is a "voluntary" retirement is open to debate.
8. It is also true that the methods of "disability management" have been used by some employers as a way to pressure workers to go back to work before they are ready, or even to persuade them not to claim workers' compensation benefits, and generally to take advantage of injured workers.
9. The full research report is available on the Upjohn Institute website at http://research.upjohn.org/up_technicalreports/4/.
10. The scales and their items are included in Appendix A of the original research report, Hunt et al. (1993).
11. This includes the Michigan Disability Prevention Study, described earlier.
12. For a broader view of reemployment options, see Hollenbeck (2015).
13. It is well established that the closer personal connections in small firms lead to many of the same methods being applied to prevent separation of employees after accident or injury.
14. There are also a small number of states that have mandated RTW by requiring the employer to take the injured worker back under certain circumstances.
15. The various methods described on the following four pages come from McLaren, Reville, and Seabury (2010).
16. Americans with Disabilities Act, Title I.
17. This does not mean that such results would be available to all, as there is likely some preselection involved in such programs.

18. Washington has a Preferred Worker Program as well. Note that Washington also collects workers' compensation premiums from workers, primarily to support medical aid benefits. Worker contributions account for approximately one quarter of total system costs for the state fund in Washington.
19. See www.ohpinc.com for more information.
20. See Gifford and Parry (2016) for evidence on occupational and nonoccupational claims.
21. See Galizzi and Boden (2003) and Baldwin, Conway, and Huang (2009).

Chapter 4

Workers' Compensation and Incentives for Preventing Injuries

Work-related injuries and diseases are costly for both workers and firms. For workers, injuries can interfere with the ability to work, thus lowering current and future income.¹ Work-related injuries are also associated with depression and anxiety (Asmundson et al. 1998; Dersh et al. 2002) and may lead to chronic pain. For firms, injuries to workers disrupt production schedules, increase labor costs, and have the potential to increase workers' compensation costs. Injuries are also costly to firms if firms value their workers' health and happiness for nonmonetary reasons or feel that injuries lower morale and productivity. According to Leigh (2011), the total cost of work-related injuries in the United States in 2007 was \$250 billion, which was more than the cost of cancer (\$219 billion), coronary heart disease (\$152 billion), or stroke (\$62 billion).

While preventing all work-related injuries is not possible, firms, workers, and the government can all reduce their likelihood through workplace safety choices. Firms choose safety equipment, safety training, safety protocol, how much to spend on a safety department, and the method of production. Workers choose their safety effort and whether to follow the safety protocol. The federal government monitors workplace safety through the Occupational Safety and Health Administration (OSHA) and sets fees for noncompliance, while many state governments have separate OSHAs that perform similar functions. State-level governments also set workers' compensation policy. All levels of government can provide information on safety, mandate that firms use certain equipment or follow certain guidelines, or subsidize firms for following certain practices.

In 1970, the Occupational Safety and Health Act set up a National Commission on State Workmen's Compensation Laws to evaluate

workers' compensation laws. The commission issued a report that identified promoting safety as one of the main objectives of workers' compensation. Workers' compensation programs can influence work-related safety in at least three ways. One is that they can provide preventive consultation services to employers and workers. A second is that they can provide general information about safety. And third, they can alter monetary incentives for safety, which is the focus of this chapter. In this chapter, we explain how workers' compensation programs can affect safety incentives, and we provide an overview of the empirical literature on the safety impacts of workers' compensation programs.

THE ROLE OF WORKERS' COMPENSATION IN OPTIMAL SAFETY

The cost of injuries goes beyond medical expenses, disrupted productivity, and lost wages. Injuries are also costly because they cause pain and suffering and because the inability to work can harm a worker's psyche. From a societal standpoint, an injury should be prevented if the social cost of the prevention efforts is lower than the social cost of the injury. The cost of injuries includes their numerous deleterious effects on workers and their families in addition to all of their monetary costs. Although injuries clearly have random elements, through prevention efforts the various stakeholders have the ability to lower the probability that they occur. Prevention efforts should be undertaken if the cost of the prevention efforts is lower than the cost of the injury multiplied by how much the injury probability is lowered by the prevention efforts. In theoretical economic models with perfect information, no frictions, and actuarially fair insurance, workers' compensation insurance is unnecessary—optimal safety levels will be achieved through worker sorting based on job risk and individuals purchasing insurance (Rosen 1974; Thaler and Rosen 1976).

According to these economic models, firms differ in their inherent risks of injuries but can influence the probability of injuries through spending on safety. Workers differ in their baseline health endowments and in their risk tolerance but can lower their injury probability by spending more effort on safety or working for a safer firm. To induce workers to accept a job, firms that engage in risk-filled work have to pay workers more than they would earn at less risky jobs. Economists call this extra payment to accept a risky job a *compensating differential*. Since workers with higher risk tolerances need less of a compensating differential, they choose riskier jobs than risk-averse workers.

The fact that firms have to pay compensating differentials for the risks their workers face provides firms with safety incentives, because they can lower the wages they have to pay workers by making their jobs safer. Each firm has the incentive to improve safety until the cost of improving it is more than the worker values the extra safety.² Although workers' compensation insurance is unnecessary in these models, optimal safety will still be achieved with workers' compensation insurance as long as firms are perfectly experience rated, which means their premiums reflect their past claims. If firms are not perfectly experience rated, higher-risk firms will be implicitly subsidized by lower-risk firms, which will lead to a suboptimal allocation of resources (Ehrenberg 1988).

In reality, the assumption of perfect information is not met in the determination of workplace safety for a variety of reasons (Fortin and Lanoie 2000). Firms and insurers cannot always accurately predict the incidence of injuries, while workers and firms may be incorrect in their estimates of occupational risk and of their own influence on the level of risk. Employers and insurers cannot effectively monitor employees' precautions, and insurers cannot monitor firms' prevention efforts perfectly. Insurers and firms may not be able to determine whether an injury is work related or even whether the worker is truly injured. In addition, experience rating is not practical for small firms in reality, because a large claim could still put them out of business.

The assumption that workers could buy insurance on their own that meets their needs and is actuarially fair is not realistic either.

Moreover, some speculate that injured workers sometimes use other disability insurance or have health insurance cover some costs of work-related injuries. Access to these other insurance programs lessens the negative consequences of an injury and means that workers and firms will not focus enough on safety. As a result, more injuries occur than would if information were perfect, and work-related injuries impose extra costs on society.³

THE IMPACT OF THE INTRODUCTION OF WORKERS' COMPENSATION ON SAFETY

Prior to workers' compensation programs being enacted in the early twentieth century, work-related injuries were addressed by worker mutual aid organizations and through the tort system. Under the tort system, workers who were injured on the job and were seeking compensation had to prove in court that their employers' negligence caused their injuries. An employer could avoid a negligence ruling by showing that the worker's actions contributed at least partially to the injury, that the injury was an inherent job risk, or that the carelessness of coworkers contributed to the injury. Because many industrial injuries were caused by seemingly inherent dangers of work, fault was difficult to assign under this system (Fishback and Kantor 1996). As a result, workers rarely won their suits. When workers did win, the resulting awards reduced the financial stability of firms and were sometimes large enough to shut down firms.

In systems with negligible transaction costs and perfect information, liability rules have no impact on the allocation of resources (Chelius 1976). But as has been already discussed, information asymmetries abound with work-related injuries. The assumption of no transaction cost is not met under the tort system either, because law-

suits are expensive. Therefore, safety was suboptimal under the tort system.

Given that most people tend to be risk averse, they would prefer reliable payments after injuries rather than the rare possibility of a large payout. By making the consequences of work-related injuries less severe for workers, the introduction of workers' compensation programs theoretically decreased safety incentives for workers on average. For firms, safety under workers' compensation programs versus the tort system is less clear. If firms are risk neutral, they would prefer whichever system had the lowest expected payout. Since payouts were lower on average under the tort system (Fishback and Kantor 1996), injuries would be cheaper for firms under the liability system than through workers' compensation. Thus, workers' compensation would likely increase safety incentives for risk-neutral firms. However, the many firms that are too small to be risk neutral may prefer workers' compensation insurance to the tort system, since one large payout could force them out of business.

Most research on the safety effects of workers' compensation programs has focused on changes to various aspects of the programs rather than on what the introduction of the workers' compensation system did to safety levels, which means that the effect of switching from a tort system to workers' compensation on safety levels remains an open question (Morantz 2010). The research that exists on the safety effects of the shift to workers' compensation reports mixed results. Although Chelius (1976) finds that the passage of workers' compensation laws in the early twentieth century reduced non-motor-vehicle deaths, Fishback (1987) finds that the introduction of workers' compensation to coal mining resulted in a rise in fatal accidents, because workers' compensation increased the median compensation award, which presumably led to workers' being less safe.

Butler and Worrall (2008) argue that workers' compensation improves safety when firms are the low-cost providers of safety but reduces safety when workers are the low-cost providers of safety.

They study the impact of federal workers' compensation introduction in 1911 on four classes of railroad workers in New Jersey and find that workers' compensation reduced injuries for outside workers, who are high-cost providers of safety, and increased injuries for inside workers, who are low-cost providers of safety. These results suggest that there was heterogeneity in the responses of different industries and of different types of workers to the introduction of workers' compensation programs a century ago.

As Texas is one of the only states where firms do not have to purchase workers' compensation insurance, as well as the state that has had nonmandatory workers' compensation the longest, comparisons between Texas firms with workers' compensation insurance and those without it (nonsubscribing firms) can provide valuable insights into the role of workers' compensation in achieving a safe work environment. Butler (1996) studies differences in injury rates between firms that purchase workers' compensation insurance and firms that do not and finds that both types of firms have similar fatality rates. He finds that nonsubscribing firms have slightly higher nonfatal injury rates and argues that this is likely because nonsubscribers tend to offer occupational injury plans that provide first-day wage-replacement benefits, which encourage workers with minor injuries to report their injuries. Butler concludes that safety levels are likely similar between subscribing and nonsubscribing firms in Texas.

In her survey of large firms who opt out of workers' compensation insurance in Texas, Morantz (2010) confirms that most firms that opt out have alternative occupational-injury insurance plans. That most firms have an alternative occupational injury plan suggests that firms prefer having insurance to the possibility of being sued. Morantz finds that the majority of large firms that opt out do it to save money, and that about one-third of firms report that they have better safety outcomes with occupational injury plans than they did with workers' compensation insurance.

MEASURING OCCUPATIONAL SAFETY

Measuring workplace safety is necessary for benchmarking safety levels and for determining what factors affect workplace safety, but collecting useful and reliable safety measures is a major challenge. Most research focuses on rates of reported injuries or on workers' compensation claims. The most commonly used data are the injury rates collected by the Bureau of Labor Statistics (BLS) through the Survey of Occupational Injuries and Illnesses (SOII). The SOII collects injury counts from a sample of firms that are required by OSHA to maintain records of injuries. The SOII also collects the number of employee hours worked at establishments and uses this information to construct injury rates. The published data set includes the number of injuries with lost workdays, the number of injuries with no lost workdays, and the number of workers at the establishment. An advantage of these data is that the record keeping is required by the federal government, which means the data include information from all states.

While the BLS data are likely the best available measure of occupational health and safety outcomes, the SOII has three major shortcomings. First, the survey does not include all workers. Specifically, the survey does not include self-employed workers, farm workers, firms with 10 or fewer employees, or any government workers. Second, the survey misses many occupational diseases, especially those that take a long time to develop. Finally, as with any data on injuries, injuries in the OSHA logs must be reported by workers and recorded by firms, which means misreporting is a concern. For more information on these data, refer to Ruser (2008).

Another way to measure workplace safety is to examine workers' compensation claims. An advantage of these data is that they are more detailed than the BLS data, in that they contain more information about the injury, its treatment, and characteristics of the worker. Workers' compensation data may also include injuries and illnesses

not contained in the SOII. But as with the BLS data, misreporting is also a concern with workers' compensation claim data.

Injured workers may not file for workers' compensation because of concerns associated with filing a claim. Filing a workers' compensation claim may be costly if employers dissuade people from filing for workers' compensation because they fear workers' compensation claims will increase their premiums. Injured workers also might not want to deal with the paperwork and bureaucracy of workers' compensation, or they may fear that they will be called on to prove that their injury was caused by work.

Some workers may feel there is a stigma associated with filing for workers' compensation, while others may worry that their standing with the employer will depreciate while they recover from their injuries. Finally, receiving workers' compensation benefits is not guaranteed even if one files a claim. Biddle (2001) shows that high denial rates of workers' compensation claims are associated with lower application rates. In their survey of injured Michigan workers, Biddle and Roberts (2003) find that a majority of injured workers with work-related injuries do not file for workers' compensation benefits. Lakdawalla, Reville, and Seabury (2007), using data from the National Longitudinal Survey of Youth, confirm that many workers who report being injured on the job to the survey report that they did not file for workers' compensation. Another issue with workers' compensation data is that the data typically come from one particular state, which makes generalizing the results difficult. States also have different reporting and data collection procedures, which complicates efforts to combine workers' compensation data from multiple states. The National Council on Compensation Insurance (NCCI) provides one of the few publicly available resources on different states' workers' compensation premiums and claims. To produce these data, NCCI surveys workers' compensation insurers each year about the premiums they receive and the claims they pay. NCCI publishes these state averages each year for most states in its Annual Statistical Bulletin (NCCI 2014).

Individual-level government-collected survey data, such as the National Health Interview Survey (NHIS) and the March Current Population Survey (CPS), provide other measures of safety in the United States and have several advantages over other data. Unlike workers' compensation data, survey data contain detailed information about a sample of all workers, regardless of whether they claim workers' compensation. This more detailed information about workers includes demographics, education, and sometimes information on family members, work, and medical histories.

The NHIS is collected by the National Center for Health Statistics and asks various questions about injuries, including whether injuries are work-related, the types of injuries, whether the injuries caused individuals to miss work, and what types of medical care workers received. The NHIS also collects other relevant demographic and health information. In addition to relying on proxy respondents, the public-use NHIS does not contain state identifiers, meaning cross-state comparisons are not possible. Because much of workers' compensation research focuses on differences across states, the lack of state identifiers greatly reduces the NHIS's use to researchers.

The March CPS asks respondents if they have received workers' compensation income in the past year. This information has been frequently used by researchers. Although it is not a panel data set, respondents can be linked across surveys, which gives the data a panel component. A shortcoming of CPS data is that they contain no details about injuries, workers' compensation payments, or medical treatment. Other individual-level surveys with injury and workers' compensation information are the Survey of Income and Program Participation, the Panel Survey of Income Dynamics, and the National Longitudinal Surveys of Youth.⁴

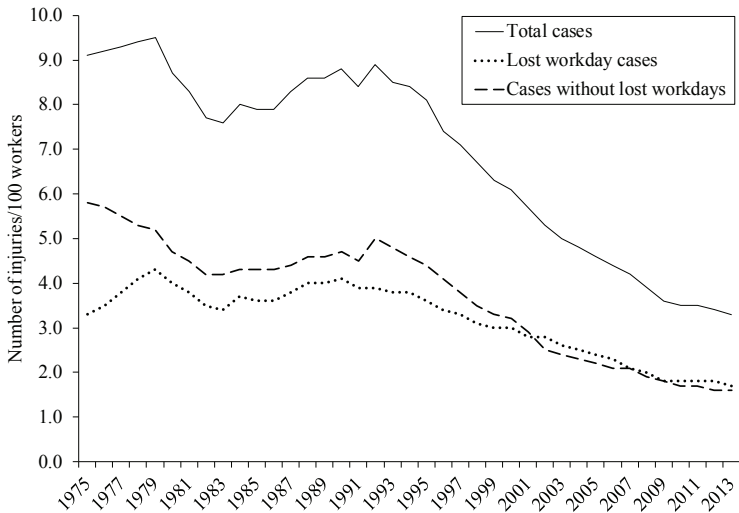
While injury rates and workers' compensation claims are a natural measure of workplace safety, the fact that workers, treating physicians, or firms have to report these injuries is problematic. As will be explained later, any factor that affects safety incentives also influences the decision to report injuries, which means reported injury rates are

a flawed measure of safety. As Morantz (2010) explains, “Probably the single most important obstacle [to estimating the effect of workers’ compensation on safety] is the paucity of truly exogenous safety metrics that are invulnerable to changes in over- or under-reporting.”

One measure that may have fewer reporting concerns than injuries is occupational deaths from traumatic injuries, which are impossible for workers to misreport and difficult for firms to misreport. In addition to collecting injury information, the BLS also maintains a census of occupational deaths, called the Census of Fatal Occupational Injuries (CFOI). Federal law requires firms to notify OSHA within eight hours of an occupational death. The BLS collects this information from OSHA and supplements it with other data sources such as death certificates and workers’ compensation records to produce the CFOI. Unlike with the SOII, the CFOI includes public-sector and self-employed workers. Prior to the BLS producing the CFOI, the National Institute for Occupational Safety and Health (NIOSH) produced the National Traumatic Occupational Fatality surveillance system, using death certificates. Although occupational deaths from traumatic events are more likely to be reported correctly, occupational deaths from slowly developing diseases are still subject to substantial reporting biases.⁵

TRENDS IN WORK-RELATED INJURIES

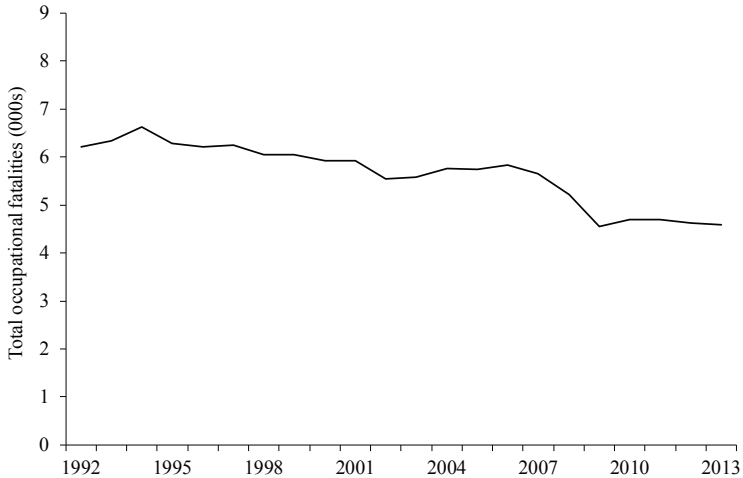
Figure 4.1 plots injury rates from the BLS data since 1975 and shows that reported work-related injury rates in the United States have been falling since the 1990s. The 1.7 injuries with lost workdays per 100 workers in 2013 is 59 percent smaller than the equivalent 1990 rate, while the 1.6 injuries without lost workdays per 100 workers in 2013 is 66 percent smaller than the 1990 rate. The injury rate for men is approximately 23 percent higher than for women, likely reflecting that men are in jobs with more manual labor. Sprains, strains, and tears account for roughly 40 percent of injuries.

Figure 4.1 Occupational Injuries per 100 Workers in Private Industry, 1975–2013

NOTE: The y axis represents number of injuries of each type per 100 workers. Total lost workday cases include those with days away from work and those with restricted work activity. For 1978, 1979, 1983, and 1984, the BLS did not include small employers in low-risk injuries in the survey, so the BLS imputed these data. Beginning in 1992, the data exclude fatalities.

SOURCE: Survey of Occupational Injuries and Illnesses, from the BLS.

As with occupational injuries, occupational deaths have fallen since the 1990s. Figure 4.2 shows the number of occupational deaths each year reported in the CFOI from 1992 to 2013. In 2013, 4,585 occupational deaths occurred. Of these, 41 percent occurred because of transportation injuries; 17 percent from violence by people or animals; 16 percent by contact with objects and equipment; 16 percent from falls, slips, and trips; 7 percent from exposure to harmful substances or environments; and 3 percent from fires and explosions. Men account for the vast majority of occupational deaths (93 percent). The highest death rates come from agriculture (23.2 deaths per 100,000 full-time equivalent [FTE] workers), transportation and

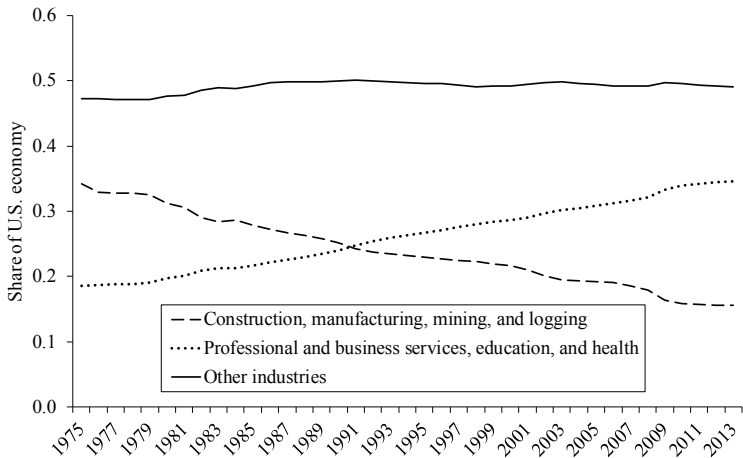
Figure 4.2 Number of Fatal Work Injuries, 1992–2013

SOURCE: BLS Census of Fatal Occupational Injuries. Data from 2001 exclude occupational deaths from the September 11 terrorist attacks.

warehousing (14.0 deaths per 100,000 FTE workers), mining (12.4 deaths per 100,000 FTE workers), and construction (9.7 deaths per 100,000 FTE workers).

No consensus has been reached about why injury rates and deaths have fallen so dramatically. Some have speculated that the decline in injuries comes from shifts in what types of industry are most prevalent. Indeed, the injury rate varies a lot by industry, and the industrial mix of the United States has changed over the past few decades. Figure 4.3 illustrates the U.S. economy's transition to being more service oriented. In 1975, there were approximately 85 percent more workers in construction, manufacturing, mining, and logging than there were in professional services, education, and health. By 2013, the share of workers in professional services, education, and health was more than double the share in construction, manufacturing, mining, and logging.

Although these patterns are consistent with shifts in industry driving the lower injury rates, the significant decline in injury rates

Figure 4.3 Private Industry Shares, 1975–2013

SOURCE: BLS Current Employment Statistics.

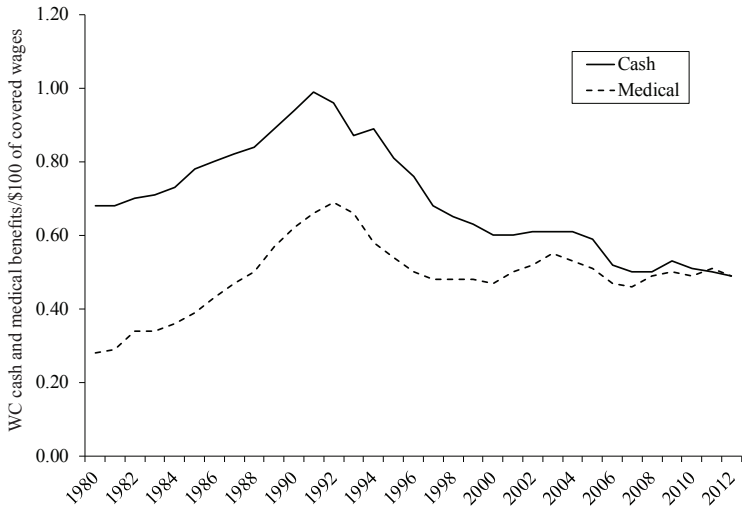
has also occurred *within* industries, which suggests that changes in the industrial composition have not, by themselves, driven the fall in injury rates. For instance, manufacturing was one of the more dangerous industries in 1994, with 12.2 injuries per 100 workers. By 2013, the injury rate had fallen to 4.0 injuries per 100 workers in manufacturing. Furthermore, it is not clear that the industries that dominate the U.S. workforce now are safer than the industrial composition of past decades. While the professional and business services sector had an injury rate of less than 2.0 injuries per 100 workers in 2013, the health care sector had an injury rate of 4.7 injuries per 100 workers, which is the highest of any of the BLS's broad injury categories.

Researchers have offered multiple alternative explanations for declining injury rates and occupational deaths. Boden and Ruser (2003) argue that workers' compensation reforms that made filing for workers' compensation more difficult suppressed the reporting of injuries, while Barkume and Ruser (2001) contend that deregulation of workers' compensation increased safety. Conway and Svenson

(1998) argue that workers' compensation reforms decreased injury rates and that unions, employers, and workers' compensation insurers have developed a better understanding of workplace hazards. Ussif (2004) claims that the gradual improvement over time of technology, information, and safety initiatives is what has been responsible for the decline in injury rates.

Regardless of the reason for the decline, the fall in the number of reported injuries and illnesses has translated into workers' compensation insurers paying less in benefits. Figure 4.4 shows cash and medical payments from 1980 to 2012. From the early 1990s, when benefits reached a maximum, until 2012, workers' compensation cash benefits per \$100 of covered wages fell by 48 percent, which mirrors the trend in lost workday injuries. Workers' compensation medical benefits per \$100 of covered wages fell only by 21 percent during this

Figure 4.4 Workers' Compensation Medical and Cash Benefits per \$100 of Covered Wages, 1980 to 2012



SOURCE: Estimates from the National Academy of Social Insurance.

time period, likely because the price of medical care rose dramatically over the period.

THE THEORETICAL EFFECT OF WORKERS' COMPENSATION BENEFITS AND EXPERIENCE RATING ON SAFETY

The benefits paid from workers' compensation programs have the potential to influence safety incentives, since they change the cost of injuries for workers and for firms. Higher medical or wage-loss benefits make injuries less costly for workers, which gives them incentives to take more risks and to pay less attention to safety. Therefore, higher benefits have the potential to lead to lower safety efforts by workers and higher injury rates from these lower efforts.

The incentive effects of workers' compensation benefits for firms come from the fact that many firms are experience rated, meaning their premiums are based on their previous claims experience. The premium of an experience-rated firm is a weighted average of the premium based on the risk of the occupations of workers at a firm and the firm's actual loss experience, where the weight placed on actual loss experience grows with firm size. Firms that self-insure bear all of the costs of workers' compensation benefits directly, which is essentially full-experience rating.⁶ For experience-rated firms, anything that raises the amount paid out to workers through workers' compensation will lead to higher workers' compensation premiums, which gives firms an incentive to increase safety efforts.

These countervailing influences of benefits on workers and firms mean the net effect of higher workers' compensation benefits on safety is theoretically ambiguous; therefore, determining the net effect requires empirical tests. However, research that studies how features of workers' compensation affect safety runs into a major empirical challenge, in that any factor that makes receiving workers'

compensation more attractive to workers or that increases the cost of workers' compensation claims for firms may have reporting effects in addition to safety effects. Workers have greater incentives to file for workers' compensation when benefits increase, because filing is now more valuable for them. Similarly, benefit increases provide experience-rated firms with incentives to discourage workers from filing and to increase claims management practices, which are strategies to reduce workers' compensation costs without increasing safety. Beneficial claims-management practices include taking proper care to make sure workers fully recover from injuries and accommodating workers as they return to work. Perverse claims-management practices include pressing workers to return to work before they have fully healed and contesting workers' valid injury claims.

These reporting incentives mean that studies that examine how injury rates change after workers' compensation benefits change are estimating the net effect of benefits on firms' and workers' safety and reporting actions. Estimating the effect of benefits on claiming rates is the goal for many studies because they are interested in understanding the financial impact of benefit changes on workers' compensation claims and costs, but these empirical challenges complicate studies examining the effects of workers' compensation benefits on safety.

THE EFFECT OF WORKERS' COMPENSATION BENEFITS ON SAFETY

The Effect on Nonfatal Injury Rates

A large empirical literature has examined the effect of workers' compensation benefit increases on injury rates and claiming behavior. Chelius (1982) and Ruser (1985) both use BLS data aggregated by industry classification to study how differences in workers' compensation benefits are correlated with injury rates. Chelius finds that an

industry having 10 percent higher workers' compensation benefits is associated with a 1.2 percent higher rate of lost workday cases. Ruser finds that having 10 percent higher benefits is associated with 1.2 to 3.1 percent more lost workday cases. Both studies find suggestive evidence that there is a smaller positive correlation between benefits and rates of injuries without missed days of work.

Butler and Worrall (1983) estimate the effect of benefits on workers' compensation claims in 35 states by using workers' compensation data from NCCI, aggregated at the state and year level. They find that 10 percent higher benefits are associated with a 4.1 percent increase in claims. They also find that the length of the waiting period before workers can receive cash benefits lowers the frequency of temporary total and minor permanent partial disabilities but not major permanent partial disabilities. These early studies all imply that workers' claiming or safety decisions are influenced by benefit levels.

The conclusions of these first studies are based on differences in benefit rates across states and industries and do not control for unobserved differences across states that may lead to high workers' compensation benefits and high injury rates. An issue with these methods is that high-risk industries or states may offer more generous benefits as a way of enticing workers into risky jobs, which would lead to a positive correlation between benefits and injuries even if benefit rates had no independent influence on injury rates.

Later research examines injury rates after states change their benefits, so the results are robust to unobserved differences across states. Krueger (1990) uses data from the March CPS matched with workers' compensation benefits in the mid-1980s and estimates that a 10 percent increase in workers' compensation benefits increases workers' compensation receipt by about 7 percent. Thus, even after accounting for unobserved differences, early studies found that workers' compensation benefits have a larger impact on workers' actions than on firms' actions, since claims and benefit payments increased in response to a rise in the schedule of benefits. If firms' actions had dominated, there would have been a decrease.

Despite the results of early work, more recent research that studies longer periods of data and also uses state benefit changes in workers' compensation benefits does not find large impacts of benefit increases on injury rates or workers' compensation claims. Guo and Burton (2010) study BLS injury data from the 1980s and 1990s and find that a 10 percent increase in benefits has little or no impact on injury rates. Bronchetti and McInerney (2012) use 25 years of March CPS data and find that a 10 percent increase in workers' compensation benefits increases workers' compensation receipt by less than 1 percent. Bronchetti and McInerney attribute their smaller estimates of the effect of benefits on workers' compensation receipt to more flexibly controlling for a person's past wages, but they also find that workers have been less responsive to benefit changes since 1990.

These more recent results suggest no significant effect of benefit rates on workers' safety choices. One possible reason that workers may not respond to benefit changes by altering their safety effort is that the changes to workers' compensation benefits, while large in some ways, are small compared to the effects on workers' health. For instance, a 10 percent increase in the maximum weekly benefit could have a major impact on workers' compensation costs for firms but would be less than \$100 per week for workers in most states, which may not be enough to affect safety decisions when considering the long-term impact of an injury or disease on the worker's health.

Studying benefit changes is a common and generally accepted research method in economics. Given that there are vast unobserved differences across states and industries, research that can compare a treatment group to a control group is a major step forward over early research. However, studies using these methods make the critical assumption that no other unobserved changes are correlated with workers' compensation benefit increases. Benefit increases that accompany other policy changes would muddy the estimates of the effect of benefit increases. For instance, if states increase benefits while also passing other workers' compensation policies to increase nonmonetary benefits for workers, the effect of benefits on workers'

compensation claims or injuries would be overestimated. But if states increase benefits and cut costs in other ways to keep employer costs down, the effect of benefits on workers' compensation claims or injuries would be underestimated.

Heterogeneous Effects for Experience-Rated Firms

Regressing injury rates or workers' compensation claims on benefit levels reveals the net effect of workers' compensation benefits on reported injuries resulting from both firms' and workers' responses to benefit increases. To study the effects on firms and workers separately, researchers test for different effects for experience-rated firms. Experience-rated firms have an incentive to improve safety and decrease injury reports after benefit increases, while only workers have safety and reporting incentives from benefit changes at non-experience-rated firms.⁷ In studying experience rating, researchers run into another data limitation in that data sources do not typically contain information on which firms are experience rated. This limitation results in researchers having to infer whether firms are experience rated, typically by using firm size. Even though firm size is likely a good proxy, data still do not include information about the degree of experience rating, leading to measurement error.

In their studies, Chelius and Smith (1993) and Ruser (1985) both use the average number of employees at firms within industries as a proxy for firm size and assume that industries with higher average workers per firm are subject to a greater degree of experience rating. Chelius and Smith do not find that industries with large firms have different responses to benefits in terms of their injury rates, compared to industries with smaller firms. Ruser, however, uses a finer industry classification and finds that the effect of the interaction between firm size and benefits on injury rates is negative. This means that higher benefits have less of an effect on the frequency of injuries in industries with firms that are more likely to be experience rated.

In another study, Ruser (1991) constructs a panel data set by matching the BLS's injury data to the BLS Current Employment Survey for manufacturers, which allows him to estimate panel models because he can examine how injury rates change within firms after benefits change. He finds that a 10 percent increase in benefits increases injury rates by 3.8–7.7 percent in establishments with fewer than 100 employees, but only by 1.8 percent in establishments with more than 500 workers. The large positive effect of benefit increases on injury rates suggests that benefit increases do cause workers to report more injuries. The smaller interaction of benefits and firm size indicates that firms that are likely experience rated take actions to reduce reported injuries, either by improving safety or by discouraging reporting.

Effects on Occupational Deaths and on Different Types of Injuries

While studies focusing on heterogeneity between small and large firms allow for testing whether experience-rated firms take actions to lower reported injuries, these studies still cannot determine whether the observed changes result from firms improving safety or from firms discouraging workers from reporting injuries. To separate safety effects from reporting effects, studies examine different types and severities of injuries. Presumably, misreporting would be more difficult for workers with severe injuries or injuries that are easily verifiable.

One set of studies focuses on death rates. With deaths, workers make no reporting decisions, so benefit increases do not result in workers being more likely to report injuries or firms being more likely to discourage reporting. Moore and Viscusi (1989) study the effect of benefit rates on death rates using NIOSH's National Traumatic Occupational Fatality data on workplace fatalities, while Ruser (1993) studies the effect of benefits on death rates from the BLS injury data matched to firms.

Both Moore and Viscusi (1989) and Ruser (1993) find that death rates decline with benefits and interpret their results as evidence that increasing benefits increases safety. This in turn reinforces the conclusion that the increase in occupational injuries accompanying higher benefits may be from reporting effects on workers.

Another set of studies argues that if workers' compensation claims increase only because of reporting, then harder-to-diagnose injuries would respond to benefit increases, while easier-to-diagnose injuries would not. Ruser (1998) uses BLS data and finds that higher benefits increase the number of hard-to-verify injuries relative to easy-to-verify injuries. Using panel data on the Quebec construction industry, Bolduc et al. (2002) also find that workers' compensation benefits increase the reporting of difficult-to-diagnose injuries but not easy-to-diagnose injuries. These results indicate either that workers have more control in avoiding easy-to-verify injuries like strains and sprains or that reporting incentives dominate safety incentives for workers.⁸

THE EFFECT OF EXPERIENCE RATING

A variety of papers focus on the direct effects of experience rating rather than on the heterogeneous effects of benefit increases on experience-rated firms. Most of these studies cover Canadian workers' compensation, likely because several recent Canadian reforms have shifted experience-rating arrangements and provide natural experiments.

Bruce and Atkins (1993) examine the impact of the introduction of experience rating in Ontario's construction and forestry industries on fatality rates. They find that experience rating is associated with declines in fatality rates, which suggests that experience rating improves safety. Campolieti, Hyatt, and Thomason (2006) examine the impact of the introduction of experience rating on workers' compensation claims in British Columbia. After British Columbia

introduced experience rating, lost-time claims, medical claims, and short-term disability claims all fell, while long-term disability claims increased. Campolieti, Hyatt, and Thomason argue that the increase in long-term claims might arise because most of the benefits for these claims are not paid until after the experience-rating window has closed, which suggests firms might save money by shifting workers with more severe injuries to long-term claims so that their experience-rating factor is not affected.

Tompa et al. (2013) study the effect of a 2004 Ontario policy change that increased the degree of experience rating. They find that experience rating decreases the number of reported injuries, especially for injuries that are easy to dispute. Tompa et al. interpret this result as evidence that firms rely on perverse claims management practices to lower costs rather than on safety improvements.

Other research surveys firms directly. Although surveying employers has a disadvantage in that firms may not be forthcoming in their responses, it has the advantage of providing information on actual safety efforts rather than on proxies for safety. Kralj (1994) surveyed Ontario employers with experience rating and finds that these firms report expanding both safety efforts and claims management efforts because of experience rating. Thomason and Pozzebon (2002) surveyed Quebec manufacturers to explore the relationships among experience rating, investment in occupational safety and health, and claims management practices. They find that experience-rated firms appear to devote more resources to safety practices, such as having injury prevention staff and incentivizing safety for their workers. But they also find that firms increase claims management by challenging more claims and encouraging workers to return to work sooner after injuries.

In addition to providing firms with incentives to discourage the reporting of work-related injuries, another shortcoming of experience rating is that it may not provide proper incentives for firms to focus on preventing occupational diseases that may take several years to develop.

Firms would underinvest in preventing slow-to-develop diseases if they expected workers to retire or change employers before the occupational disease manifests or if it would not surface until after the experience-rating period ended. For these reasons, even a perfectly experience-rated firm may have more workers with occupational diseases than would be optimal. For similar reasons, firms may not have proper incentives to make sure workers recover fully from their injuries.

EFFECTS OF OTHER ASPECTS OF WORKERS' COMPENSATION ON SAFETY

In addition to the level of workers' compensation benefits and the impact of experience rating, any aspect of workers' compensation that makes obtaining workers' compensation benefits easier or improves workers' experience with workers' compensation has the potential to affect safety incentives. In response to the National Commission report, mentioned on pages 65–66, which found that workers' compensation benefits were inadequate, many states increased workers' compensation benefits in the 1980s. As a result, the benefits paid from workers' compensation rose dramatically in the 1980s, which can be seen in Figure 4.4 on page 78. These increases in the amount of benefits paid resulted in large increases in workers' compensation premiums for employers. In response to these rising premiums, many states introduced workers' compensation reforms in the 1990s to lower workers' compensation costs. These reforms included the following six:

- 1) Requiring workers to demonstrate disability with objective medical evidence
- 2) Restricting or eliminating workers' choice of physician
- 3) Capping legal fees or shifting the payment of attorneys' fees from insurers to injured workers

- 4) Eliminating compensation for the aggravation of a preexisting condition or for a condition related to the aging process
- 5) Increasing fraud detection by raising the penalties for fraudulent claims or by establishing fraud investigation units
- 6) Requiring that work be a major or predominant cause of the injury

Ruser, Pergamit, and Krishnamurty (2004) study the effects of restricting physician choice, increasing fraud detection, and restricting the types of injuries eligible for workers' compensation. Since these changes make filing for workers' compensation more difficult and lower the probability of receiving workers' compensation benefits, these laws increase workers' safety incentives while reducing firms' safety incentives. Despite the theoretical basis for safety changes, Ruser, Pergamit, and Krishnamurty find no change in the likelihood that individuals in the 1979 National Longitudinal Survey of Youth were injured or filed for workers' compensation benefits, suggesting either that the reforms had no safety effects or that the counteracting effects offset each other. The 1979 National Longitudinal Survey of Youth has the appealing advantage of following individuals over time, meaning compositional changes to the labor force cannot drive the effects.

Boden and Ruser (2003) study those states that restricted provider choice as well as states that began requiring objective evidence for workers' compensation claims using BLS establishment-level data. They compare how injury rates changed over time in states that modified their laws compared to how injury rates changed over time in states that did not modify their laws. They find that provider choice has no appreciable effect on injury rates, while more stringent evidence requirements significantly decrease reported injury rates and can account for between 7.0 and 9.4 percent of the decline in reported injuries from 1991 to 1997.

Workers' compensation insurance has traditionally been subject to a variety of price regulations, but, beginning in the 1970s, some

states began to relax these regulations. Barkume and Ruser (2001) assess the effects in states that no longer require preapproval of insurance prices and the effects in states that no longer have rating bureaus that determine all workers' compensation insurance prices. They find that in addition to lowering workers' compensation premiums, states no longer requiring preapproval also led to reductions in BLS injury rates.

Barkume and Ruser (2001) interpret these results to mean that allowing insurers to charge rates that more closely reflect firms' risk of losses encourages firms to improve safety. These results provide more evidence that having firms pay premiums that reflect their own risk factors encourages firms to improve safety.

However, as discussed throughout this chapter, having premiums that more closely match expected losses also encourages firms to increase claims management practices. Thomason, Schmidle, and Burton (2001) consider how competition influences safety by comparing BLS injury rates in states with three different insurance systems: 1) states with exclusive-fund workers' compensation insurance, 2) states that permit only private insurers to issue policies, and 3) states with competitive state funds. They find that states with exclusive-fund workers' compensation insurance have the highest injury rates, followed by states with only private insurers and then by states with competitive state funds. These results provide more evidence that competition in the insurance market can lower reported injury rates. The likely mechanism is through improving risk-based rating and more accurate insurance pricing, but we still cannot determine whether the lower injury rates are from safety effects or reporting effects.

Another study examines the safety effects of firms having large deductibles for their workers' compensation policies, which a majority of states permit. With large deductibles, even smaller firms are essentially self-insured until they reach the deductible, which gives them an incentive to improve safety levels. Although large deductibles may still carry too much risk for small firms, medium-size

firms can realize lower premiums from investing in safety but still be covered in the case of a catastrophic event. Shields, Lu, and Oswald (1999) use Texas workers' compensation claims data and find that firms that adopt high-deductible policies experience immediate declines in large indemnity claims and delayed effects on reducing other workers' compensation claims. They interpret these results to suggest that improving safety takes time but that firms can increase claims management practices quickly. At any event, the evidence is very strong that more direct employer incentives lead to lower workers' compensation claims incidence, whether from improved safety or from more aggressive claims management.

DIRECT WORKERS' COMPENSATION SAFETY INTERVENTIONS

Many states take a more direct approach to promoting safety by encouraging or requiring firms to develop their own safety and prevention programs. In several states, incentives provided through workers' compensation are instrumental in encouraging these programs. Examples of workers' compensation programs encouraging or requiring safety programs include the following:

- In Massachusetts, assigned risk firms receive a workers' compensation premium credit for enrolling in a loss management program.
- North Dakota offers a 5 percent annual discount on workers' compensation premiums for firms that enroll in a risk management program.
- Pennsylvania workers' compensation offers a 5 percent discount on workers' compensation insurance premiums for firms with a certified joint labor management safety committee.
- From 1991 to 2005, Texas workers' compensation had a program that mandated that the most hazardous workplaces im-

plement illness and injury prevention programs. This program was dropped when Texas made its law nonmandatory.

Although state workers' compensation programs generally report that these programs reduce injuries, very few of these programs have been studied by independent researchers. An exception is the Pennsylvania program, which Liu et al. (2010) study by examining factors that affect program participation and by estimating the impact of safety programs on injury rates. To do this, they combine Pennsylvania workers' compensation data with unemployment insurance data and use propensity score matching to create a control group. They find that large firms, firms with higher injury rates, firms in high-risk industries, and firms without labor unions were more likely to join the safety committee program and less likely to drop out. Although their results show that firms that complied with the requirement to train their safety committee members experienced reductions in injuries, noncompliance with this requirement was too high for them to be able to detect an overall effect.

CONCLUSION

This chapter has discussed the role of workers' compensation programs in preventing occupational injuries and illnesses. As we explained, factors that make workers' compensation better or easier for workers have the potential to decrease workers' safety incentives. Factors that increase the cost of workers' compensation increase experience-rated firms' safety incentives.

Experience rating, as well as any other strategy to make workers' compensation premiums reflect employers' past claims histories, also has the potential to improve safety and bring it closer to optimal levels. In addition to creating safety incentives, worker-friendly workers' compensation policies and benefits also have reporting incentives. This complicates empirical research on the role of workers' compensation in encouraging injury prevention.

Although much of the research is conflicting in its findings or cannot adequately deal with all of the empirical challenges, we consider the following conclusions to be warranted. First, having firms' workers' compensation premiums reflect previous claiming history appears to improve safety. Having workers' compensation premiums reflect prior losses can be achieved through experience rating or through encouraging price competition in the workers' compensation insurance market, both of which align premiums with claims experience. Also, high-deductible workers' compensation policies can give even smaller employers the same incentives for prevention as experience rating.

While making premiums more closely match claims history increases firms' attention to safety, it also increases firms' incentives to discourage workers from claiming workers' compensation benefits and to encourage workers to return to work before they are ready. As workers likely already underreport work-related injuries, workers' compensation programs must make sure that incentives to improve firm safety do not result in workers being left out of the workers' compensation safety net.

Another shortcoming of experience rating is that it does little to prevent occupational disease injuries, which develop over long periods of time. As workers have shorter tenures with firms now than they had in the past, firms can expect that other firms will have to deal with the increased workers' compensation costs from such occupational injuries, which reduces their incentives for prevention.

Although much evidence documents a positive relationship between injuries and workers' compensation benefits, we think the evidence is inconclusive that workers' compensation benefits encourage workers to act more recklessly, despite the theoretical basis.

Even given the vast improvements in the empirical sophistication of research methods and in precautions taken for workers over the years, separating out the reporting effects and safety effects for workers and firms remains a major challenge. Similarly, better data

on injuries is vital in determining whether workplace safety is driving down injuries or whether workers are just reporting fewer injuries.

Finally, we conclude that more direct and innovative research is needed on the impact of safety programs and on workers' compensation incentives to encourage firms to implement them. However, it is clear that even the best-designed safety programs will require compliance for them to succeed.

Notes

1. For ease of exposition, we use the term *injuries* throughout the chapter to refer to any compensable claim, including occupational diseases.
2. Broad empirical support is found in economic research that shows workers are paid a wage premium for working in riskier jobs. Refer to Viscusi and Aldy (2003) for a thorough review of this literature.
3. While McInerney and Simon (2012) find no evidence that making workers' compensation more difficult to obtain increases take-up of federal disability insurance, Dillender (2015) and Heaton (2012) both find evidence that workers' having health insurance results in less medical care being paid for by workers' compensation. Dillender (2016) discusses the potential influence of the Affordable Care Act's expansion of health insurance on workers' compensation insurance.
4. See Reville, Bhattacharya, and Weinstein (2001) for a review of possible sources.
5. It should also be noted that occupational deaths and diseases have benefit-adequacy concerns, as many surviving spouses entitled to benefits do not receive the benefits due them.
6. Retrospective rating is another type of insurance policy that has incentives similar to experience rating. With retrospective rating, firms' premiums depend on their claims during the policy period. Retrospectively-rated firms pay their premiums at the start of the policy period. Firms with high losses will have to pay additional premiums, while firms with low losses will receive refunds on their premiums. Retrospective rating is less common than experience rating, and we are unaware of research into the safety effects of retrospective rating.
7. If all small firms improved safety, WC claims and costs would fall, since premiums for small firms are based on all similar firms' previous claims experience. In the absence of experience rating, however, one firm's actions cannot have a noticeable effect on its own premiums.

8. Comparisons of hard-to-diagnose injuries and easy-to-diagnose injuries originate from a set of papers that study increased claiming on Mondays as a way to test whether workers' compensation benefits induce people to claim that non-work-related injuries are work related. Smith (1990) pioneered this research by showing in workers' compensation claims data that harder-to-diagnose injuries such as strains and sprains are more likely to be reported on Mondays than easier-to-diagnose injuries like cuts and fractures. Smith interprets his findings as evidence that workers purposefully misreport some non-work-related injuries from the weekend as being work related. However, in their studies of the Monday effect, Campolieti and Hyatt (2006) and Card and McCall (1996) find evidence that is inconsistent with Smith's interpretation.

Chapter 5

Conclusion

In this final chapter, we will review some of our findings from earlier chapters, with a focus on what those findings tell us about workers' compensation performance and policy issues. The previous chapters focus on three of the most critical issues in workers' compensation policy: benefit adequacy, injury prevention, and return-to-work promotion. This concluding chapter provides our overview of the state of workers' compensation programs on these dimensions in the early twenty-first century, after approximately 100 years of experience in most states and provinces.

BENEFIT ADEQUACY

Our chapter on benefit adequacy departs in two ways from most of the other empirical work on this subject. First, it includes studies of workers' compensation in Canada and our home state of Michigan that raise some methodological issues. Michigan does not have a statutory designation of permanent partial disability (PPD) compensation as most other states do. As a wage-loss state, Michigan law provides that lost earnings benefits shall be paid for the duration of the disability, with a few exceptions. Furthermore, when claims are closed in Michigan, there is no designation of the level of disability, so there is no impairment rating available, but simply a record of the payments made.¹

Furthermore, the Michigan population of claimants receiving lump-sum settlements includes those who file claims with disputed coverage, questionable etiology, causation issues, level of disability controversy, and many other matters without causative attribution. Therefore, it is difficult to compare findings on the adequacy of workers' compensation benefits in Michigan with states that designate ben-

efits according to impairment ratings and states where PPD is specifically identified and accounted for.

The Canadian workers' compensation systems are similar to those in the United States, with two very significant differences. First, there is generally no private insurance for work-related injuries in Canadian provinces; all workers' compensation insurance is with public entities. Second, benefits are typically more generous, and waiting periods are either shorter or nonexistent. By including studies of these jurisdictions in our review of workers' compensation benefit adequacy, we hope to enlarge the discussion and expand the possibilities. This despite the fact that adding more system observations also raises the bar for generalization and makes policy conclusions even more challenging.

Second, our preference is to use the yardstick of "earnings replacement" as opposed to "loss replacement" to measure benefit adequacy. This means we count both workers' compensation wage-loss benefits paid and actual earnings after the injury as income and offset these against the estimated wages that would have been earned in the absence of injury. We think this is a more useful measure of average benefit adequacy than loss replacement rates. Loss replacement rates consider postinjury earnings as reducing the losses suffered by the injured worker, but they also serve to narrow the focus to just the performance of the workers' compensation system rather than the broader social goal of maintaining workers' incomes during disability.

Previous empirical work on workers' compensation benefit adequacy has concluded that these benefits are far from meeting reasonable standards of adequacy—usually set at replacement of two-thirds of lost wages after taxes. Furthermore, some studies indicate that the performance seems to be worse for the more serious injury cases, as indicated by duration of disability or impairment rating.

Despite the limitations to comparison imposed by major policy and analytical differences, it appears that the Michigan workers' compensation system provides more adequate benefits than many other

state systems. This appears to be largely due to the wage-loss orientation and the “spendable earnings” wage replacement formula used in Michigan. Taking account of income, payroll taxes, and family size clearly provides the opportunity for tailoring wage-loss replacement more closely to apparent need across all workers. So, despite a lower maximum benefit in Michigan set at 90 percent of the state average weekly wage, versus 100 percent in most U.S. states, workers’ compensation wage-loss benefits in Michigan look pretty good.

If the Michigan benefits appear to be better than in some other U.S. states, they are clearly not as adequate as in the Canadian systems that have had similar wage-loss studies. Benefits in British Columbia and Ontario are significantly more generous than in Michigan or in other U.S. states. This is reflected in higher wage-replacement ratios, higher maximum benefits, and shorter waiting periods (if any). It may also reflect the fact that all the Canadian provinces have exclusive-fund (monopolistic) public insurers for workers’ compensation.

Whether this results in more “generous” administration of the systems as well is debatable, but the realized benefits are clearly superior.

There remains the crucial issue of the adequacy of benefits for permanent or long-term injuries. This has been the focus of most of the earlier empirical work on the subject, and the results are not reassuring: The comparative study done by Reville et al. (2001) showed a range of 29 to 46 percent for 10-year loss-replacement rates for the five states included in the study. Tompa, Mustard, et al. (2010) found aggregate loss-replacement rates of around 100 percent for claims with more than 50 percent impairment ratings under both the impairment standard in Ontario before 1990 and the loss-of-earnings-capacity standard in Ontario after 1990. For the “bifurcated benefit” system in British Columbia before 2002, the loss-replacement rate for these claims was 126 percent.²

In Michigan’s wage-loss system, since there is no impairment rating, we focus just on those claims that receive lump-sum settlements (called “redemptions” in Michigan). While it is no doubt cor-

rect that most of these claims would receive permanent partial awards in other U.S. states, there is no way to compensate for the additional proportion of these claims that might be compromised over disputes on coverage, etiology, or other issues. Inclusion of these claims would presumably bias the Michigan measure of adequacy downward.

Yet the lump-sum settlement claims in Michigan showed a 92 percent loss-replacement rate and a 95 percent earnings-replacement rate for the observed average of 4.5 years after the injury. When this is extrapolated to 10 years, including the claim reserves held by the insurer, the earnings replacement rate falls to 67 percent, still a decent performance. Results are slightly better for claims with wage-loss benefit duration over 52 weeks but no lump-sum settlement. Again, benefit adequacy appears to be better in Michigan than in the other U.S. states where benefit adequacy has been studied.

The last issue raised by the benefit adequacy chapter is that of leaving the labor force as a result of a compensable injury. Injured workers who file workers' compensation claims appear to experience a permanent drop in labor force participation similar to that which occurs when the employer goes out of business completely. While the reasons for this drop in labor force participation are unclear, it further complicates the analysis of benefit adequacy. It raises the issue of whether withdrawal from the labor force was caused by the compensable injury itself, the settlement of the claim, or perhaps by other influences. However, it is still troubling to think that so many injured workers are not able to resume their work lives after a compensable injury.

PREVENTION INCENTIVES

As economists, we begin with the assumption that both workers and employers (with their insurer representatives) make choices about providing safety and about their response to injury. Employers provide the workplace and explicitly select the level of safety designed

into that workplace. They also adopt human resource policies that may encourage or discourage safe behaviors. Workers may accept the safety environment of the firm, but they still make choices about how careful they will be in preventing an injury and how they will respond to incentives provided after an injury.³

What makes this interesting is that the financial incentives for workers and employers contradict each other. Employers seek to minimize costs for a given level of production. This would include compensating wage differentials for the risk of injury, the costs of producing a safer environment, and the costs of workers' compensation insurance. Workers face the loss of income during a period of disability plus the obvious pain, suffering, and inconvenience that may accompany the injury itself. But better workers' compensation benefits (i.e., higher earnings-replacement rates) reduce the incentive for workers to avoid injury.

Although much empirical evidence points to a positive relationship between frequency of injuries and workers' compensation benefits, we feel the evidence is inconclusive that better workers' compensation benefits actually encourage workers to act more recklessly, despite the theoretical basis and despite the fact that claim rates are often higher after benefits increase. This is because there is also a reporting effect observed when compensation is improved. If the incentive to report the injury is increased by more generous benefits, a larger proportion of injuries will be reported, and a higher incidence of claims will be observed. Separating reporting effects from safety effects among injured workers remains a major empirical challenge.

However, making workers' compensation premiums more accurately reflect the previous claims history of individual employers appears to improve employers' safety and prevention efforts, as well as to encourage employers to devote more attention to the worker's successful return to work. Methods to make premium levels more closely match claims history include experience-rated premiums, encouraging more competition in the workers' compensation insurance market, and offering high-deductible plans to employers. All of

these devices should help to make the employers' cost of workers' compensation insurance more closely reflect the actual cost of injuries, thereby bringing financial incentives into alignment with policy objectives.

Despite the promise of having insurance premiums more closely match actual claim costs, thus providing improved signaling about prevention behavior, policymakers need to be aware of two concerns. First, claim costs that influence premiums also provide firms with incentives to discourage workers from claiming workers' compensation benefits at all, and such behaviors likely encourage workers to return to work before they are ready. In both cases, claim costs and future premiums will be lower even though it is not clear that the policy objective has been met.

Second, having claim costs influence employer insurance premiums does little to prevent occupational diseases or other injuries that develop over long periods of time. Even self-insured employers who pay all workers' compensation costs directly still have too many such disability claims. Thus, while market-signal incentives could be improved, it does not seem possible to replace direct regulation of safety and health matters with market incentives through the workers' compensation program. We will continue to need public health standards and direct enforcement mechanisms to protect the health of workers and others.

RETURN TO WORK

While preventing work-related disability should be our ultimate aim, and ensuring adequate compensation our intermediate policy goal, returning the injured worker to his or her place of employment is the immediate practical challenge. We will never be able to prevent all injuries and diseases, and maintaining adequate benefits is a political struggle with ebbs and flows, but there should be no dispute about

return to work as the goal for all stakeholders in workers' compensation programs.

The "win-win" aspect of return to work is highly motivating, as workers' incomes will be higher and employers' costs will be lower if injured workers can be put back to work more swiftly and safely. But this takes a continuous, concentrated, and coordinated effort to achieve.⁴ The term *disability management* has come to represent a workplace-focused approach that includes a set of techniques designed to improve return-to-work performance. These techniques began to be applied in the 1980s as workers' compensation costs increased at unprecedented rates. Leading employers perceived that the "soft glove" was more productive than the "hard fist" when it came to coping with work-related disability. Maintaining contact with the injured worker, improving medical management, and accommodating limitations at work, including job modification, schedule changes, and alternative work assignments, were demonstrated to reduce the incidence and duration of work-related disability.

Furthermore, the disability-management approach aligns naturally with employee retention by the original at-injury employer, which produces vastly superior return-to-work results for the injured worker while it also demonstrates the employer's commitment to the workforce. As well, it may also reduce the cost of disability when viewed from a social perspective (Ben-Shalom 2015). So what has been the impact of disability management techniques on workers' compensation outcomes? Unfortunately, we have to be satisfied with indirect evidence of these impacts. The number of reported occupational injuries and illnesses with any days away from work declined by 66 percent from 1993 to 2013 (BLS 2016). In most U.S. states, three to seven days away from work are required to qualify for wage-loss benefits, so the number of workers' compensation wage-loss claims has obviously declined rapidly as well. The National Council on Compensation Insurance (NCCI) reports a 58 percent decline in such claims between 1993 and 2010 (Sengupta, Baldwin, and Reno 2014). Interestingly, the average duration for workers' compensation

wage-loss claims has actually risen over the past two decades. We conjecture that disability-management techniques are more effective at targeting small workers' compensation claims for relatively minor injuries than they are at shortening claims arising from serious or catastrophic injuries. This would explain the increase in duration of claims.

Additionally, the number of cases with restricted work, which includes the effect of many disability management techniques, rose from the mid-1980s through 2000 at the same time that the number of cases with days away from work was declining (Ruser and Wiatrowski 2013). We believe this reflects the spread of disability management techniques through the ranks of employers, insurers, and providers and their subsequent impact on workers' compensation claims and return-to-work outcomes for injured workers.

Credible evidence on the impact of return-to-work programs is sparse but promising. Impacts of up to 40 percent reduction in disability duration have been reported among large self-insured firms (McLaren, Reville, and Seabury 2010). Several review articles have found strong empirical support for the effects of disability management techniques. We conclude that properly motivated disability management techniques can remove many barriers to return-to-work for workers with impairments, which reduces both workers' compensation costs for employers and lost wages for workers. Disability management holds considerable promise for improving this critical performance dimension of workers' compensation systems. This is reflected in the plethora of state policy innovations that directly or indirectly support or encourage these interventions.

There remain some concerns about the potential for disability management to descend into claims-discouraging activities, or "perverse disability management," which has the goal of reducing claims volume or severity to reduce workers' compensation costs without benefit to the injured worker. We believe that workers' compensation claims suppression is real and is practiced by some employers and their insurers for financial gain. However, we also believe that,

overall, disability management has been a positive development in workers' compensation systems and has benefited both injured workers and their employers. We need better focus and more measurable outcomes to ensure that these benefits are realized.

So, where do workers' compensation programs stand after a century of experience? The ProPublica/NPR series of publications beginning in 2015 raised serious questions about the performance of our state workers' compensation systems.⁵ The title of the initial article, "The Demolition of Workers' Compensation" (Grabell and Berkes 2015), prompted widespread reaction, both pro and con.

According to the U.S. Department of Labor, "Recent years have seen significant changes to the workers' compensation laws, procedures and policies in numerous states, which have limited benefits, reduced the likelihood of successful application for workers' compensation, and/or discouraged injured workers from applying for benefits" (USDOL 2016, p. 2).

Furthermore, "Some state legislatures continue to attempt to reduce workers' compensation costs, and proposals for statutory amendments that restrict workers' benefits or access have become increasingly bold" (USDOL 2016, p. 2). This has extended up to and including the "opt out" legislation in Texas and Oklahoma and the discussions in Tennessee and South Carolina. It remains to be seen whether an effective replacement for traditional workers' compensation programs will emerge from these experiments.

However, we find that for the three performance dimensions examined here, things are not quite so bleak in the workers' compensation world. First, there are design elements, such as the spendable earnings approach within a strict wage-loss system, that seem to provide better adequacy of workers' compensation benefits than the medical-based impairment-and-gross-earnings-replacement approach. Second, workers' compensation and other market incentives do appear to improve employer safety and prevention performance. They also seem to affect the claiming behavior of injured workers. Third, disability manage-

ment techniques can significantly reduce the burden of work-related disability for both workers and employers in our workplaces.

We hope this modest volume will help policymakers to improve the performance of these social insurance systems during their second century. There are several ways forward, and they have been implemented in best practice among several state systems. What seems to be lacking is the political resolve to change these century-old workers' compensation systems to move toward better policy and practice in the future.

Notes

1. There may also be an amount reserved for future medical benefits, which must be reported to CMS at the federal level to facilitate coordination with possible Medicare or Medicaid benefits.
2. The bifurcated system provided that the higher of the impairment or the loss-of-earning-capacity benefit should be paid.
3. Of course, the level of safety provided by the firm may also be a factor in their choice of employer.
4. See Gifford and Parry (2016) for discussion.
5. For a list of this series of articles, see ProPublica (2017).

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About the Institute

The W.E. Upjohn Institute for Employment Research is a nonprofit research organization devoted to finding and promoting solutions to employment-related problems at the national, state, and local levels. It is an activity of the W.E. Upjohn Unemployment Trustee Corporation, which was established in 1932 to administer a fund set aside by Dr. W.E. Upjohn, founder of The Upjohn Company, to seek ways to counteract the loss of employment income during economic downturns.

The Institute is funded largely by income from the W.E. Upjohn Unemployment Trust, supplemented by outside grants, contracts, and sales of publications. Activities of the Institute comprise the following elements: 1) a research program conducted by a resident staff of professional social scientists; 2) a competitive grant program, which expands and complements the internal research program by providing financial support to researchers outside the Institute; 3) a publications program, which provides the major vehicle for disseminating the research of staff and grantees, as well as other selected works in the field; and 4) an Employment Management Services division, which manages most of the publicly funded employment and training programs in the local area.

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