The Adequacy of Workers' Compensation Cash Benefits

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Workers’ compensation is the primary form of financial support available to people who are injured or become ill as a result of their employment. In 2001, workers and their medical care providers received $49.4 billion in workers’ compensation payments, and employers paid out $59.2 billion (NASI 2003). By covering medical costs and replacing lost earnings, workers’ compensation can minimize the economic impact of workplace injuries and illnesses, although other impacts will remain.

The designers of workers’ compensation programs did not intend for nonmonetary losses to be covered. Workers lost the right to receive payments for “pain and suffering” in the quid pro quo in which they were required to give up their ability to sue negligent employers in exchange for workers’ compensation benefits that were provided on a no-fault basis. But, presumably, they did intend for lost earnings to be covered, although the question of how much of the lost earnings should be covered by workers’ compensation benefits remains an unsettled issue. While benefit adequacy is a central goal of workers’ compensation, other goals often come into conflict with adequacy. These include high workers’ compensation costs to employers, concerns about worker fraud, and excessive time off work. Responses to these perceived prob-
lems include reducing cash benefits and limiting eligibility for workers’ compensation benefits.

This pattern was particularly evident during the 1990s, when more than half the states modified their workers’ compensation laws. During that period, many of the laws that were passed were designed to reduce employers’ costs by either reducing benefits or limiting the number of claims filed (Burton and Spieler 2001; Boden and Ruser 2003).

Traditionally, workers’ compensation systems have required employers to pay benefits to workers whose injuries or illnesses “arise out of and in the course of employment.” Other contributing factors, like preexisting medical conditions, the aging process, and workers’ lifestyles may have contributed to work-related disabilities, but this did not in principle prevent workers from receiving benefits. Laws passed in the 1990s limit the compensability of conditions that are not solely caused by workplace risks. They do so by creating a number of new requirements for receiving benefits. These include requiring that work be a major or predominant cause of the disability or eliminating compensation for the aggravation of a preexisting condition or for a condition related to the aging process. Other restrictive laws allow workers to demonstrate disability only by using objective medical evidence. These new laws can make it much more difficult to receive compensation for chronic musculoskeletal disorders, including carpal tunnel disease, noise-induced hearing loss, and most back injuries. Thomason and Burton (2001) estimate that such legislation enacted by Oregon in the late 1980s and early 1990s reduced benefits for workers and costs for employers by about 20 to 25 percent below what the amounts would have been if the laws had not been enacted. Finally, during the 1990s at least 22 states passed workers’ compensation antifraud laws. Following passage, some states began aggressive public campaigns threatening criminal sanctions for workers who filed fraudulent claims. These campaigns sent the message that it was dangerous to file a claim, that the authorities would be checking on you, and that perhaps it was safer, even for truly injured workers, not to file.

In addition to limiting access to benefits, several states reduced benefit payments in the 1990s. Some reduced the weekly benefit paid (for example Connecticut and Massachusetts), while others reduced the maximum number of weeks that could be paid, even for workers with permanent disabilities.
The issue of benefit adequacy was not addressed in any of these cases. Legislators did not even have access to data on benefit adequacy. In fact, virtually the only quantified policy parameters available to legislators were cost-related: incurred benefits per claim, claim frequency, changes in costs and frequency, overall costs, premium rates, insurer financial data, and so on. Weekly benefit payment parameters and benefit payment data were available, but nobody could relate them to the adequacy of benefits, since losses incurred by injured workers were unknown.

In the research presented in this paper, we describe the kind of data that would allow an informed discussion of benefit adequacy as a system goal and of the trade-offs between adequacy and cost. We first explain the measure of adequacy we use. This is followed by a brief review of empirical studies of adequacy from 1950 through the 1980s. Based on research completed in the last five years, we bring together what we currently know about the adequacy of workers’ compensation cash benefits in the small number of states that have been studied. Finally, we discuss the implications of research to date for a workers’ compensation research and policy agenda.

THE IMPORTANCE OF WORK-RELATED DISABILITY

For the year 2002, the U.S. Bureau of Labor Statistics reported about 5,500 deaths\(^1\) and 5,000,000 occupational injuries and illnesses\(^2\) in the private sector. These numbers are substantial, but a growing number of studies indicate that they greatly underestimate the true extent of the problem because many workplace injuries go unreported (Biddle et al. 1998; Morse et al. 1998; Morse et al. 2001; Azaroff, Levenstein, and Wegman 2002). Even in the face of substantial underreporting, the total economic costs of occupational illness and injury have been estimated to rival those of cancer and heart disease (Leigh et al. 1997, 2000). These illnesses and injuries also have important noneconomic effects on quality of life. Physical and psychological functioning in everyday activities can be affected, self-esteem and self-confidence reduced, family relationships stressed (Morse et al. 1998; Keogh et al. 2000; Pransky et al. 2000; Strunin and Boden 2004). Although we do not address these
nonmarket effects of workplace injuries, they may well be as important as the effects on earnings.

THE NATURE OF WORK-RELATED EARNINGS LOSSES

Many workplace injuries are minor and result in little or no time lost from work. For these injuries, no lost earnings result. Workers may lose a little time from the job to receive first aid, but this does not affect their wages. For other injuries, workers may need more substantial medical treatment and may incur functional limitations that do not allow them to return to their regular work immediately. These limitations may cause them to stay home or may require restrictions on the tasks that they can perform at work. The interaction of these functional limitations, workers’ skills, and job demands can lead to time lost from work or to work limitations that result in reduced wages. These consequences of workplace injuries can last a few days, but they can also last a lifetime.

The factors that affect injury-related losses are not confined to the medical consequences of injuries. Labor market and other behavioral factors can affect the amount of earnings lost. Economists have focused on the incentive effects of workers’ compensation benefits on how quickly workers return to employment (for example Meyer, Viscusi, and Durbin 1995), but these are not the only behavioral factors in operation. Friction between workers and employers over the amount of benefit payments, disputes about readiness to return to work, and employer concerns about fraudulent claims can result in the employer’s refusal to offer a job or a worker’s refusal to return to the at-injury workplace. Any of these can cause lost earnings to be considerably higher than necessitated by the physical consequences of the injury as a result of increased job search time and the loss of job-specific human capital.

When employees cannot work for a long time, their employers may find it too costly to continue to hold their jobs open and, as a result, may replace them. The resulting job loss also can substantially increase overall lost earnings. In addition, future potential employers may view a long period off work or a workers’ compensation injury as a negative signal about the worker, thus reducing future job opportunities.

This combination of functional limitations and labor market behavior leads to lost earnings that may persist for many years. This is the
context in which workers’ compensation systems provide benefits that replace part of workers’ lost earnings.

DEFINING BENEFIT ADEQUACY

As a social insurance program, workers’ compensation is supposed to cushion the financial impact of injuries on workers and their families. In principle, this means that cash benefits should cover much of the losses workers would otherwise incur. Benefit adequacy can thus be measured by the extent to which losses are replaced. The replacement rate—benefits received as a proportion of pretax losses—is thus the fundamental measure of benefit adequacy in this program.3

If we accept the replacement rate as a measure of adequacy, the question of what replacement rate is adequate immediately follows. There is no obvious answer to this question. One approach is to make the worker whole by covering all financial losses. Under this approach, adequate benefits would be 100 percent of after-tax losses net of job-related expenses plus any loss of fringe benefits and any earnings lost by other family members because of the injury. This would leave the worker financially as well off as if the injury had not occurred. In addition, high benefits would increase employer incentives to control workplace hazards. However, there are a number of reasons to consider lower replacement rates. First, providing full replacement reduces the incentive to return to work and thus may increase the overall costs of injuries. In addition, employers worry that the resulting high costs may affect their competitive position. Finally, although employers generally pay workers’ compensation premiums, high premiums will reduce the demand for labor and may lead to lower wages. In this sense, workers pay for a part—possibly a large part—of the cost of workers’ compensation insurance in the form of lower wages (Leigh et al. 2000, pp. 175–179). At a high enough benefit level, they might prefer to take higher wages rather than increased benefits. As in other forms of insurance, workers might be willing to trade incomplete coverage for a lower premium.

There is no theoretical justification for a specific adequacy benchmark, but we have chosen two-thirds of pretax earnings as our measure. We justify it largely for historical reasons. Most states pay temporary total disability (TTD) benefits at two-thirds of preinjury earnings up to
a maximum weekly amount, an indication of substantial agreement. This is also the standard used by the 1972 National Commission on State Workmen’s Compensation Laws for temporary total and permanent total disability benefits. Although there is no similar explicit standard for permanent partial disability (PPD) benefits, Berkowitz and Burton (1987) and Hunt (2004) suggest using the two-thirds standard for these benefits as well. In addition, greater coverage of small losses than of large losses is not generally an efficient use of insurance. So if two-thirds replacement is the standard for temporary disability, it is difficult to justify a lower standard for PPD.

Given these considerations, we will use two-thirds of pretax lost earnings as a standard of adequacy. For ease and simplicity, we will not attempt to account for lost fringe benefits (which would reduce the measure of adequacy) and expenses related to employment (which would increase it).

MEASURING BENEFIT ADEQUACY

Measuring Losses

To measure the adequacy of cash benefits, we use the replacement rate, the present value of benefits paid divided by the present value of losses, both discounted to the date of injury. To measure wage replacement, we need to measure injury-related lost earnings and compare the losses to workers’ compensation benefits received. Although there are some practical difficulties in determining the amount of income benefits paid, these difficulties pale in comparison to the effort required to measure lost earnings.

Lost earnings are actual earnings minus what would have been earned if the injury had not occurred. Figures 3.1 and 3.2 adapted from Reville (1999), display a conceptual model of lost earnings. Before the injury, the worker’s earnings are observed. Figure 3.1 shows them at about $19,000 annually and increasing slowly through time. After the injury, the worker recovers at home or in the hospital. Earnings are zero until the worker begins work again. At that point, wages may return to the uninjured earnings path (indicated by the dashed line). This figure displays a TTD. Upon return to work, some people continue to work
fewer hours or at a lower rate of pay or experience more unemployment than would have been the case had the injury not occurred. Eventually, many recover to the preinjury earnings path, but others never do. In this case, workers have a permanent disability. This is shown in Figure 3.2, where injured earnings never reach the level of uninjured earnings.

If we could observe uninjured earnings, then we could simply subtract them from injured earnings to determine lost earnings. This is represented by the shaded areas in Figures 3.1 and 3.2. However, a worker is either injured or uninjured at a moment in time. If we observe somebody’s injured earnings, we cannot observe their uninjured earnings. So we must find a way to estimate uninjured earnings from another source.

Traditionally, workers’ compensation systems have used average preinjury earnings as the measure of uninjured earnings, assuming that the worker would have continued at the same level of earnings absent the injury. In the short run, this is probably a good assumption. But in the longer run, this assumption is less likely to hold. On average,
for example, most workers’ earnings rise as they get older, peaking at age 45–50, then declining, with a sharp decline at retirement, which, for many, is age 65. The age-earnings profile differs depending on a number of factors, including education. The earnings of more-educated people tend to be higher and peak later in life. One implication is that, for workers with permanent disabilities, using preinjury earnings might underestimate losses for young workers and overestimate them for workers over 50.

An alternative is to estimate uninjured earnings of injured workers by finding workers who are similar to the injured workers in all other respects but who were not injured. If we can identify uninjured workers who have the same personal, job, and employer characteristics, the same wage and job histories over the year before the injury, and so on, then it is reasonable to think that their average (uninjured) earnings will be close to the average uninjured earnings of their injured counterparts.

Figure 3.2  A Conceptual Model of Permanent Injury-Related Losses

SOURCE: Adapted from Reville (1999).
This can also be tested by examining whether the uninjured earnings of the two groups before the match period are the same.

Two approaches have been used to estimate uninjured earnings: matching and regression. The matching approach uses a comparison group of uninjured workers and matches each injured worker to one or more uninjured workers with similar relevant characteristics in the immediate preinjury period. In the research discussed below, up to five uninjured workers are matched to specific injured workers if they were employed in the same workplace at the time of injury and, in addition, had wages in each of the four preinjury quarters within 10 percent of the injured worker. Even though we wouldn’t expect this to be true in every case, statisticians have shown that, under reasonable conditions, average uninjured earnings of the two groups should be identical. The most important of these is that comparison workers must be chosen so that all factors that affect both the probability of injury and earnings are accounted for.

Under these conditions, the average earnings of uninjured workers matched to a specific injured worker provide an estimate of what the injured worker’s earnings would have been in the absence of injury. In each observed postinjury period, this estimate of uninjured earnings is subtracted from the actual wages of the injured worker. This difference produces an estimate of the injured worker’s losses for each period. These estimated losses are then averaged for all injured workers over all observed postinjury periods to obtain an estimate of average losses.

The other currently used statistical approach to measuring losses, the regression approach, doesn’t try to match individual injured and comparison workers. Instead, it uses statistical regression techniques to generate models of average earnings over time for uninjured workers with specific individual, job, and employer characteristics. It then applies these models to injured workers with the same characteristics, generating estimated uninjured earnings for those workers. This is similar to generating age-earnings profiles for workers with given characteristics. As with the matching method, the difference between the postinjury earnings of injured workers and their estimated uninjured earnings estimates their wage losses. These losses are then averaged for all workers to obtain a measure of average wage losses.
Measuring Benefits

Measuring benefits is generally easier than measuring losses, as in many states insurers and self-insured employers report benefit payments to state agencies. Benefit payments typically are reported by type of benefit (medical, temporary disability, PPD, and so on). However, cases involving disputed benefits often are resolved by settlements in which the parties agree to a specified amount as full and final payment of all benefits. As such, these settlements often include not only payments to cover lost wages but also to account for future medical costs and possibly other factors as well. Typically, settlements do not distinguish among types of benefits, so we cannot tell how much is being paid to cover lost earnings.

The approach in the research presented in this chapter allocates all settlements entirely to cash benefits. For this reason, it overestimates both cash benefits and the replacement rate. We believe that the bulk of settlement payments goes to cover lost earnings, but certainly not 100 percent.

THE PROBLEM OF UNDERREPORTING

To this point, the discussion of adequacy has been based on estimating adequacy for injuries reported as lost-time workers’ compensation cases. However, there is growing evidence that many injured workers do not file workers’ compensation claims. Recent studies of filing for physician-diagnosed upper-extremity musculoskeletal disorders suggest that only in a small minority of cases did workers’ compensation cover these cases (Biddle et al. 1998; Morse et al. 1998; Morse et al. 2001). Part of the reason for the low coverage rates for these cases is that employers and insurers may not believe that all of them are work-related. However, even in the case of work-related finger amputations, an obviously work-related and reportable injury, Sorock, Smith, and Hall (1993) found that 12 of 134 patients entitled to workers’ compensation benefits were not paid from that source.7

It could be argued that the amount of underreporting and the losses involved in unreported injuries should be taken into account in measuring adequacy, since workers with injury-related losses who do not
receive cash benefits have replacement rates of zero. So, for example, if a state’s replacement rate was 50 percent but workers with 40 percent of the losses received no benefits, the true average replacement rate would be 30 percent. We do not have adequate information to know the proportion of losses that go uncompensated. As a consequence, we cannot estimate the extent to which underreporting affects average replacement rates.

Although the amount of underreporting is related to the generosity of benefits, from a policy perspective the question of how to design the benefit structure is distinct from that of how to insure that all eligible workers receive the benefits to which they are entitled. Thus, it might be better to view the estimates we calculate as measures of how well a workers’ compensation system serves those who participate in it.

**EARLIER STUDIES OF ADEQUACY**

The study of workers’ compensation benefit adequacy using claim-level data began with the publication of a study of California workplace injuries that occurred in the 1950s. In this study, Cheit (1961) derived hypothetical postinjury uninjured earnings by adjusting preinjury earnings by changes in the general level of wages and by changes in earnings related to age. He concluded that more than half these workers received permanent disability benefits without any permanent earnings losses. For workers who experienced permanent losses, however, PPD benefits typically replaced only a small fraction. For workers with rat- ings under 70 percent, he concluded that benefits typically replaced less than 10 percent of losses. Benefits covered 36 percent of losses for workers with the highest disability ratings.

Ginnold (1979) studied workers in Wisconsin who had an occupational injury in 1968 resulting in PPD benefit payments. He measured expected earnings by adjusting average earnings of injured workers in the two years before injury by average changes in wages and prices for the economy as a whole. He further adjusted this by an “age-education factor,” capturing how earnings change over a person’s working life. Five years after injury, Ginnold calculated that male workers in the group he studied still were losing an average of 16 percent of predicted earnings. Ginnold estimated that permanent disability benefits averaged
either 16.4 percent or 24.6 percent of pretax lifetime earnings losses, depending on whether he used a 5 percent or a 10 percent discount rate, respectively.

In a study of people injured at work during 1968 in Florida, California, or Wisconsin, Berkowitz and Burton (1987) calculated expected earnings using the preinjury average earnings of injured workers as a base. They adjusted these preinjury earnings by a growth ratio derived from the earnings growth of workers who were injured in California in 1968 and who received permanent disability ratings between 1 and 5 percent. This adjustment was based on the assumption that injured workers in the other states were similar to those in California and that workers in California with disability ratings less than 6 percent had no permanent loss of income after the healing period. Berkowitz and Burton measured income benefits net of legal fees for 1968 through 1973. Discounted earnings losses estimated by Berkowitz and Burton for permanently disabling injuries averaged 8 percent of potential earnings in Wisconsin, 15 percent in Florida, and 18 percent in California. In this study, pretax replacement rates in Wisconsin averaged 75 percent. In Florida they averaged 59 percent, while in California they were only 46 percent.

Replacement rates estimated by Berkowitz and Burton for permanently disabling injuries for 1968 in Wisconsin are much higher than those derived by Ginnold. Average benefits paid in the two studies are similar, but Ginnold calculated higher future earnings and thus higher earnings losses. The primary difference between the two estimates appears to be that Berkowitz and Burton focused only on the six years after the injury, while Ginnold projected earnings losses to the expected working life of the injured workers. The average age of injured workers is in the mid-30s, so the expected postinjury working life is about 30 years.

Johnson, Cullinan, and Curington (1979) measured income replacement among workers with permanent impairment ratings of at least 10 percent. These workers were injured between 1968 and 1970 in California, Florida, New York, Washington, or Wisconsin. The authors estimated expected earnings by adjusting preinjury earnings for inflation and for average productivity changes in the private sector. In 1975, five to seven years after injury, many of these workers still had substantial earnings losses. The authors then calculated after-tax replacement rates for the
year 1975, focusing on workers whose earnings losses were estimated to be at least $500. For this group, workers’ compensation replaced only 9 percent of after-tax losses. For about one-third of the injured workers, the study estimated earnings losses in 1975 at less than $500, with losses averaging $45. This group received mean benefits of $163.

RECENT STUDIES OF ADEQUACY

Methods

Beginning in the late 1990s, researchers began a series of studies of lost earnings and benefit adequacy in California, New Mexico, Oregon, Washington, and Wisconsin. These studies are based on empirical estimates of injured workers’ lost earnings (Biddle 1998; Peterson et al. 1998; Boden and Galizzi 1999; Reville 1999; Reville et al. 2001). Studies in all these states provide estimates of the losses of workers receiving permanent disability benefits or settlements. In addition, studies of Washington and Wisconsin also provide estimates of losses of workers who received cash benefits only for temporary disability benefits (Biddle 1998; Boden and Galizzi 1999).

All these recent studies use state workers’ compensation claims data linked to quarterly earnings data from the state agency responsible for administering unemployment insurance. This provides data on earnings before and after the date of injury. Biddle (1998) and Boden and Galizzi (1999) use linear regression methods to estimate both injured and uninjured earnings. Their comparison groups are workers with minor injuries.9 To calculate uninjured earnings, Biddle uses workers with medical-only injuries (with either no lost time or less than 4 days lost time). Boden and Galizzi use injured workers who lost 8–10 days from work but who lacked permanent disability benefits.10 Both studies apply these methods to all lost-time injuries and, in addition, separate injuries into groups by whether permanent disability benefits were paid and, for claims involving only temporary disability, by the duration of disability.

Using data from California, Peterson et al. (1998) and Reville (1999) were the first to use matching methods to estimate injured workers’ losses. Their comparison group consists of between one and five
uninjured workers at the same firm as the injured worker and with earnings in the year before the injury within about 10 percent of the injured worker’s. A later study uses this matching method applied consistently to the five states for which there are now adequacy measures (Reville et al. 2001). In all these studies, the authors estimate losses only for cases involving permanent disability payments or settlements.

The researchers in these studies acquired data on postinjury earnings for periods ranging from 3½ to 9 years after injury. Even for the states with the longest period of postinjury earnings data, average losses continue to be substantial throughout the entire observed period. Figure 3.3 shows the average actual earnings of workers with permanent disability claims in Oregon relative to the earnings of matched uninjured workers. The difference between uninjured earnings (represented by the horizontal line labeled “100 percent”) and actual earnings is the estimate of losses. In this figure, we can see that these losses remain approximately 20 percent of uninjured earnings for at least five years after injury. The long-term nature of these losses presents researchers with a dilemma. Because the vast majority of cash benefits are paid within five years of injury, and losses continue long into the future, limiting estimated losses to the observed period would significantly underestimate

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**Figure 3.3 Earnings of PPD Recipients Relative to Uninjured Earnings**

![Graph showing earnings comparison](image)

**SOURCE:** Authors’ Calculations.
lifetime injury-related losses but not workers’ compensation benefits. As a consequence, replacement rates would be overstated. On the other hand, many people would not be comfortable with the accuracy of losses projected 30 years into the future (the average age at injury is about 37). The results we report here are a compromise, with losses projected from the end of the observed period until 10 years after the injury.

**Benefit Adequacy for All Lost-Time Cases**

Studies of losses for all lost-time cases have been completed for only two states: Wisconsin and Washington. These two studies were done in the late 1990s and used regression methods. We have recalculated losses and benefits for the Wisconsin and Washington regression studies, using assumptions equivalent to those used in the matching studies below.\(^{11}\)

Boden and Galizzi (1999) used regression methods to estimate losses and adequacy for workers injured in Wisconsin in 1989–1990. As shown in Table 3.1, for cases with only temporary disability benefits paid, losses increase with duration of disability payments, with average losses reaching over $53,000 for men receiving more than 16 weeks of temporary disability benefits. In fact, average losses for both men and women in this category exceeded losses in the permanent disability category.

Boden and Galizzi found that estimated quarterly losses for injuries less than 6 weeks in duration were not significantly different from zero after the first two postinjury quarters, so they set later losses to zero. For some groups estimated losses were small and positive, while for others they were small and negative. If we did cumulate these small positive (but statistically insignificant) losses over 10 years, we substantially increase estimates of total losses and reduce estimated replacement rates to about 10 percent for the groups with less than two months of TTD benefit payments. It is possible that small long-term losses are a consequence of averaging a very large proportion of cases with no losses with a small proportion of cases involving substantial long-term losses but for which benefits were stopped after a short period. Researchers have not yet been able to determine if this is the case.\(^{12}\)

On the other hand, many workers in Wisconsin who lose at least two months of work and who do not receive permanent disability pay-
ments clearly have large and continuing losses. The relatively low average temporary disability payment suggests that these injured workers have losses that continue long past the termination of these benefits. In terms of losses, they are in a similar position to workers who receive permanent disability benefits, except they do not receive these additional benefits. As a consequence, their benefits are much less adequate than for permanent disability cases.

Biddle (1998) carried out a similar study of workers in Washington State who had job-related injuries in 1993–1994. In this study, he

<table>
<thead>
<tr>
<th>Losses per injury ($)</th>
<th>Replacement rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men (n=36,283)</strong></td>
<td><strong>Women (n=18,026)</strong></td>
</tr>
<tr>
<td>TTD benefits only</td>
<td></td>
</tr>
<tr>
<td>8–10 days</td>
<td>704</td>
</tr>
<tr>
<td>11–14 days</td>
<td>1,098</td>
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<tr>
<td>2.1–4 weeks</td>
<td>1,541</td>
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<tr>
<td>4.1–8 weeks</td>
<td>2,899</td>
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<tr>
<td>8.1–16 weeks</td>
<td>24,118</td>
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<tr>
<td>16.1+ weeks</td>
<td>53,515</td>
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<tr>
<td>PPD benefits and settlements (including TTD benefits)</td>
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<td>PPD benefits</td>
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<td>Compromise settlements</td>
<td>82,843</td>
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<tr>
<td>All claims</td>
<td>14,427</td>
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NOTE: Does not include lost fringe benefits. For groups with more than 8 weeks of TTD, PPD, or compromise benefits, losses are projected for 10 years. For other groups, loss calculations are limited to the quarter of injury and the next quarter. Real discount rate is 2.3%.

provided estimates for losses and replacement rates for 3½ years after injury for temporary disability cases divided into groups by duration, as well as for PPD cases and settlements. For this chapter, we project Biddle’s initial results to 10 years postinjury, which are displayed in Table 3.2. As with our estimates for the Wisconsin data, we have cumulated only two quarters of losses for people with, at most, 60 days (8½ weeks) of TTD. As in Wisconsin, this method indicates generally adequate replacement rates for the group with at most 60 days of TTD (with only one replacement rate below 50 percent). For people with disabilities lasting longer than 60 days, losses are very large and replacement rates are 30 percent or less. For permanent disability and settlement cases, replacement rates are about 40 percent. Injured workers in Washington with at least 180 days of temporary disability benefits do somewhat better than those with a shorter duration of payments, but they still do not do as well as those receiving permanent disability ben-

<table>
<thead>
<tr>
<th>Benefit Category</th>
<th>Average pretax wage loss ($)</th>
<th>Replacement rate (%)</th>
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</thead>
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<tr>
<td></td>
<td>Men</td>
<td>Women</td>
</tr>
<tr>
<td>TTD benefits only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 15 days</td>
<td>710</td>
<td>524</td>
</tr>
<tr>
<td>15–30 days 2–4 wk</td>
<td>1,765</td>
<td>1,179</td>
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<tr>
<td>31–60 days 4.1–8 wk</td>
<td>2,791</td>
<td>1,925</td>
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<tr>
<td>61–180 days 8.1 wk+</td>
<td>36,672</td>
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<tr>
<td>More than 180 days</td>
<td>84,741</td>
<td>73,557</td>
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<tr>
<td>PPD benefits and settlements</td>
<td>48,362</td>
<td>38,190</td>
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NOTE: Does not include lost fringe benefits. For groups with more than 8 weeks of TTD, PPD, or compromise benefits, losses are projected for 10 years. For other groups, loss calculations are limited to the quarter of injury and the next quarter. Real discount rate is 2.3%. Both wage losses and benefits are observed for 3.5 years following the injury or illness.

SOURCE: Authors’ calculations, updated from Biddle (1998).
benefits or settlements. Overall, these results are similar to the Wisconsin results in Table 3.1.

In both states, the data suggest that a substantial proportion of workers with very long-term losses do not receive permanent disability benefits. These losses may occur because of labor market effects that persist long after full medical recovery from the injury. For example, workers who take months to recover from their injuries may lose their at-injury jobs and thereby lose their investments in skills and seniority at those jobs. This may cause long-term losses despite full medical recovery. If permanent disability benefits are only paid for workers with incomplete recovery, these workers will not receive them. Another explanation for this finding is that some workers who are eligible for permanent disability benefits are not aware of their eligibility and that these benefits are not paid voluntarily by the responsible employer or insurer.

**Benefit Adequacy for Permanent Disability Cases**

The most ambitious attempt to date to estimate lost earnings and workers' compensation adequacy across several states has studied permanent disability cases in five states: California, New Mexico, Oregon, Washington, and Wisconsin. These estimates use matching methods as described above. Table 3.3 shows the characteristics of the samples used. Losses of 6,000–32,000 injured workers were analyzed, with an average of about four matched uninjured workers for each injured worker. Maximum follow-up time ranged from six years in New Mexico and Washington to nine years in Wisconsin (the beginning of 1989 through the end of 1997).

We studied these five states because they had collected the necessary data and were willing to share them with us. While there is no reason to think that these states are representative of all 50 states, there is substantial variation among the systems. Washington offers workers' compensation insurance through its exclusive state fund, while California and Oregon have competitive state funds, and New Mexico and Wisconsin have private insurers only. The states also have very different benefit payment levels, with California paying $1.58 per $100 of covered wages in 2001 compared with $1.68 in Washington, $0.88 in Oregon, $1.12 in Wisconsin, and $0.86 in New Mexico (NASI 2003).
These workers’ compensation systems also have different features that may affect the magnitude of lost earnings and, thereby, benefit adequacy. California’s system is known as one of the most litigious, with attorney representation in 75 percent of PPD cases and 30 percent of lost-time cases (CWCI 2003), and Wisconsin’s is recognized for its low rate of attorney involvement—only in 24 percent of PPD cases and 5 percent of lost-time cases (authors’ calculation from 1989–1990 Wisconsin workers’ compensation data). The other states’ litigation rates fall somewhere in the middle. Litigation may increase tensions between workers who feel they are being treated poorly and employers who feel that they are being taken advantage of. This may well inhibit recovery of earnings losses by making workers less interested in returning to the at-injury employer and employers less interested in taking back injured workers.

In addition, several states have programs providing incentives to employers to hire disabled workers. Oregon offers its Employer-at-Injury Program, which assists time-of-injury employers with job modifications and other costs of reemployment. Both Washington and Oregon have also instituted Preferred Worker Programs that offer subsidies to other employers to hire occupationally disabled workers. Wisconsin and Oregon have two-tier permanent disability benefits that pay higher benefits to workers who do not return to work at or close to the pre-injury wage. These provide incentives to the at-injury employer to offer...
jobs to their injured employees. Finally, the Wisconsin law provides for penalties to employers who unreasonably refuse to hire injured workers.

Figure 3.4 shows the relative earnings of workers receiving permanent disability benefits in all five states over the five years after injury (with only four years of postinjury earnings available for Washington). In each of the five states, the general pattern is the same. There is a drop in earnings in quarters 1 and 2, and some recovery. However, the pattern differs across states. The initial drop in earnings is steepest in Wisconsin, California, and New Mexico. Wisconsin and New Mexico experience a larger recovery than those in California. Earnings drop the least in Oregon and Washington.

Table 3.4 reports 10-year earnings losses and replacement rates for the five states. The earnings losses results are also shown in Figure 3.4. Proportional earnings losses in California are the highest, followed by Wisconsin and then New Mexico. They are lowest in Washington and Oregon. In all five states, replacement rates are no more than 46 percent, varying from a low of 30 percent in Wisconsin to 46 percent in

Table 3.4 Ten-Year Earnings Losses and Replacement Rates PPD claims, (2003 $)

<table>
<thead>
<tr>
<th></th>
<th>California 1994</th>
<th>Washington</th>
<th>New Mexico</th>
<th>Wisconsin</th>
<th>Oregon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ten-year losses ($)</td>
<td>68,139</td>
<td>47,925</td>
<td>40,172</td>
<td>55,404</td>
<td>44,691</td>
</tr>
<tr>
<td>Potential earnings ($)</td>
<td>266,797</td>
<td>290,956</td>
<td>194,287</td>
<td>250,773</td>
<td>232,478</td>
</tr>
<tr>
<td>Total benefits ($)</td>
<td>25,372</td>
<td>19,456</td>
<td>18,398</td>
<td>16,374</td>
<td>16,273</td>
</tr>
<tr>
<td>Proportional losses (%)</td>
<td>26</td>
<td>16</td>
<td>21</td>
<td>22</td>
<td>19</td>
</tr>
<tr>
<td>Pretax replacement (%)</td>
<td>37</td>
<td>41</td>
<td>46</td>
<td>30</td>
<td>36</td>
</tr>
</tbody>
</table>

SOURCE: Adapted from Reville et al. (2001).

New Mexico. California has both the highest losses in dollars and the highest proportional losses (losses as a fraction of potential earnings).

Differences across states in outcomes for injured workers may be driven by differences in their workers’ compensation systems, but they may also be driven by differences in the characteristics of injured workers and their employers. For example, we can see from Table 3.4 that the potential earnings of injured workers in Washington are 50 percent higher than in New Mexico. In addition, industry composition and the proportion of employers who are self-insured (an indirect measure of employer size) differ among the five states. These factors may affect both losses and benefit adequacy. To control for them, we match the PPD claims in California with claims in each of the other four states on industry (one-digit SIC) and insurance status of the employer. We retain matches where the other state’s claims are within 10 percent of the average wage of the matched California claim over the four quarters before injury. We then examine the losses and benefits of these California-matched claims in each state.

The question we seek to answer is, if workers with PPD claims in the other states have the same preinjury wage and are working in the same industry, in firms of similar employment size, and with the same insurance status as PPD claims in California, what will be their lost earnings and replacement rates? The answer is in Table 3.5. Except for New Mexico, whose estimated replacement rate decreases substantially, replacement rates change by three percentage points or less. In
none of the five states do replacement rates come close to the two-thirds standard for adequacy.

Table 3.5 compares losses and adequacy across the five states, but it does not account for one very important difference among the states: the fraction of workers with temporary disability benefits who also receive permanent disability benefits varies from 17 percent in Wisconsin to 41 percent in California (Table 3.6). If we assume that the distribution of injury severity is the same from state to state, then an additional 24 percent of injured workers in Wisconsin with TTD who lost more than 7 days off work would have received permanent disability benefits if they had been injured in California. Judging from the results of the studies in Wisconsin and Washington described above, workers with long temporary disability but no PPD benefits tend to have high and continuing losses. And because they have high losses and don’t get PPD benefits, they have very low replacement rates. Averaging them in with other Washington workers who received PPD benefits would reduce the overall average benefits for the 41 percent who would have been eligible for benefits if they worked in California. For this reason, Wisconsin’s workers’ compensation system is even less generous compared with California’s system than indicated in Table 3.5. The same is the case for the other three states.
To account for differences in the propensity to award permanent disability benefits, we attempt to create for each state a sample of 41 percent of the most severe injuries involving more than three days off work. Because we do not have an independent measure of severity, we use workers’ compensation benefits as a proxy. We begin with all permanent disability cases. To make other states comparable to California, we randomly select additional people in each temporary disability duration group so that the proportion in that group that would have received permanent disability in California is included in the comparison.

For example, in California, 96 percent of workers in the top 10 percent of temporary disability durations are receiving permanent disability. In Washington, 64 percent of workers in the top 10 percent are receiving permanent disability. We calculate the replacement rate for the 64 percent who actually receive permanent disability in Washington, plus an additional randomly selected 32 percent of workers with temporary disability in the top decile (not including those receiving permanent disability) so that 96 percent of the top decile (including all actual permanent disability cases) are represented in the sample. We repeat this exercise for every decile so that the resulting sample is 41 percent of all lost-time claims in each of the states.

Table 3.7 displays the results of this exercise. It provides a picture of losses and replacement for people who would have received permanent disability benefits if they had been injured in California. By definition, California’s losses and replacement rates are the same as in Table 3.5. The other three states’ losses are lower than when only their permanent disability cases are included, but their benefits are lower yet. The result is a decline in replacement rates for all three. The four states have replacement rates between 23 percent and 37 percent—well below the two-thirds standard of benefit adequacy.
Table 3.7 Ten-Year Earnings Losses and Replacement Rates, Four States, Matched PPD Claims Augmented with Long-Term TTD (2003 $)

<table>
<thead>
<tr>
<th></th>
<th>California 1994</th>
<th>Washington</th>
<th>Wisconsin</th>
<th>Oregon</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-year losses ($)</td>
<td>68,139</td>
<td>50,044</td>
<td>36,214</td>
<td>40,144</td>
</tr>
<tr>
<td>Potential earnings ($)</td>
<td>266,797</td>
<td>253,242</td>
<td>249,714</td>
<td>260,387</td>
</tr>
<tr>
<td>Total benefits ($)</td>
<td>25,372</td>
<td>14,502</td>
<td>8,347</td>
<td>13,739</td>
</tr>
<tr>
<td>Proportional losses (%)</td>
<td>26</td>
<td>20</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Pretax replacement (%)</td>
<td>37</td>
<td>29</td>
<td>23</td>
<td>34</td>
</tr>
</tbody>
</table>

SOURCE: Authors’ calculations.

It is also notable in Table 3.7 that the proportional losses experienced by California’s PPD recipients are substantially higher than for equivalent workers in the next highest state, Washington. Indeed, they are 76 percent higher than the average losses of equivalent workers in Wisconsin.

**CONCLUSION**

Benefit adequacy is a central goal of workers’ compensation. Yet, in most states we know little about whether cash benefits are indeed adequate. Our initial studies in five states have shown that, for many groups of injured workers, replacement rates do not approach the two-thirds benchmark for adequacy. This gives us cause for concern, as there is no reason to believe that other states’ replacement rates will be much higher than the five states we have studied to date. It also underlines the importance of conducting studies of adequacy in additional states.

To the extent that benefits are inadequate, it would be helpful to understand the effects of policies available to increase replacement rates. Potential policy choices include increasing weekly benefit payment levels, increasing the level of benefits paid for each percentage point of permanent disability, changing permanent disability guidelines to increase the likelihood that people with a given level of lost earnings will receive permanent disability benefits, and eliminating roadblocks
that prevent injured workers from receiving workers’ compensation benefits. Each of these policies would directly increase overall benefit payments to workers and therefore increase costs to employers. Additionally, each would buck the recent trend toward reducing benefits and eligibility.

Alternate approaches focusing on benefits would try to improve the distribution of benefits by targeting benefits more toward groups with particularly low replacement rates or toward groups with particularly large losses. These steps would improve the equity of benefit distribution. However, unless they worked hand-in-hand with benefit increases, they would imply substantial reductions in benefits for untargeted groups.

Another approach is to try, ex post, to target benefits at people whose compensation turns out to be incommensurate with their losses. Most permanent disability systems provide benefits in expectation of losses. Naturally, sometimes people’s actual losses differ substantially from what was predicted. To address this, Texas has a supplemental benefit program that identifies people with large and continuing losses and pays additional benefits to them.

Other avenues to improve benefit adequacy would focus on reducing lost earnings of injured workers or on reducing injury rates. Both of these approaches have the potential to increase replacement rates without increasing employer costs. One area that may have great potential is private or public policies directed at return-to-work at the at-injury employer. Studies also have shown that, when the preinjury employer rehires the injured or disabled worker, time lost from work is reduced substantially and the employment trajectory is improved (Burkhauser, Butler, and Kim 1995; Galizzi and Boden 2003). The Oregon Employer-at-Injury Program is an example of such an approach. As described earlier, it provides subsidies to employers who offer modified or light-duty jobs to allow injured workers to return to work before they have fully recovered from their workplace injuries. The primary goal is to maintain employment at the at-injury employer and thus to improve the trajectory of postinjury employment and earnings.

To fully understand the implications of these and other policy alternatives for improving benefit adequacy, much additional research would be required. Our understanding of the adequacy of workers’ compensation benefits is in its infancy. The list of important unanswered ques-
tions is long and could form the basis of a valuable research agenda. Still, this does not absolve us from attempting to respond to the challenge of inadequate benefits.

We end this chapter with a partial list of important questions that we would like to see addressed in future research. Answers to these questions would provide an empirical basis for policymakers to decide among alternatives for improving the adequacy of workers’ compensation benefits.

1) How do replacement rates differ among states? For example, do states with high maximum weekly benefits tend to have high replacement rates? Do states with a high propensity to provide PPD benefits have high replacement rates? Does unionization affect replacement rates?

2) To what extent could replacement rates from workers’ compensation be increased through more effective assistance with return to work or job accommodations? How effective are current state programs designed to encourage the at-injury employer or other employers to offer jobs to injured workers? How effective are vocational rehabilitation programs?

3) Are losses reduced and adequacy improved by two-tier PPD systems that pay higher benefits if employers do not rehire injured workers in comparable jobs?

4) How effective is the supplemental benefit program in Texas in increasing benefit adequacy for workers with large losses?

5) To what extent do workers receive benefits from other wage-replacement programs, such as Social Security disability or retirement benefits, unemployment insurance, state temporary disability benefits, employer sponsored pensions, sick leave or private long-term disability insurance? How different would total replacement rates be if they included payments from other programs?

6) Do injured workers also lose nonwage (fringe) benefits? Which benefits are lost, and what is the value of these losses to the worker? If we include lost fringe benefits, how would this affect our measure of the adequacy of benefits?
7) How much are the increased costs to families because they must care for injured workers or replace household work formerly done by them? How much are the offsetting savings to workers from reduced work expenses, such as commuting, child care, food, and clothing? And how do these impact benefit adequacy?

8) Does absence from work, from any cause, lead to reduced future earnings? If so, how long an absence must occur before the future loss becomes significant? Does an absence as a result of work-related injury or disease exhibit the same or a different pattern of future wage loss than an absence due to some other reason?

9) What impact do the costs of obtaining benefits have on the adequacy of the benefits actually received by workers (e.g., what are the effects of delays and the reduction in claimants’ net recoveries after payment of attorney fees and litigation expenses)?

10) What is the relationship between pretax and after-tax wage replacement rates in different states?

11) To what extent can losses be predicted by medical information about the injury, such as the information used in the American Medical Association Guides?

12) Are there worker, employer, or labor market characteristics that affect losses and replacement rates? Examples include gender, race, age, preinjury earnings, and union status; employer size and industry; and state unemployment rates.

13) In states where this issue has not yet been studied, are replacement rates relatively low for workers with long-duration temporary disability but no permanent disability benefits? If this disparity exists, can we determine its causes?

14) To what extent do states with high rates of litigation have higher or lower replacement rates (net of attorney fees paid by workers)? If any differences exist, what are the underlying reasons for them?

15) To what extent are large losses of injured workers caused by the functional limitations caused by their injuries?
16) To what extent are these losses caused by labor market impacts of time lost from work, injury-related job loss, or stigma attached to workers with long-term injuries and illnesses?

17) What is the magnitude of losses related to workplace injuries that do not receive workers’ compensation income benefit payments? How do these uncompensated cases affect overall replacement rates? To what extent do changes in workers’ compensation laws affect the proportion of injuries that go unreported?

18) Can the methodology used in the recent studies of adequacy be simplified and/or explained so that state agencies can conduct adequacy studies?

19) What are the advantages and disadvantages of the various methods used to estimate earnings losses in the earlier and recent studies of adequacy? For example, Ginnold (1979) relied on state income tax records, and Berkowitz and Burton (1987) relied on Social Security earnings records, while the recent studies have relied on state unemployment insurance records.

Notes

3. Adequacy can also be measured by whether family income is restored to a socially acceptable level, such as the poverty level. This concept of adequacy is not typically applied to the workers’ compensation program. However, limitations on weekly temporary disability benefits (typically to 100 percent of the state average weekly wage) do reflect this notion of adequacy to some extent. For a more complete discussion of alternate measures of workers’ compensation adequacy, see Hunt (2004).
4. Some states pay at a somewhat different rate, and others pay based on a measure of after-tax earnings, but this is the predominant rate. For short-term injuries, replacement is lower because of the impact of the waiting period.
5. Because benefits and losses occur over time, and benefits and losses years from now are worth less than if they occurred today, we discount them, using an annual real discount rate of 2.3 percent. This is drawn from Social Security Administration studies. We also convert benefits and wages to 2003 dollars to take inflation into account.
6. There is no reason to expect that individual workers’ losses will be captured by this method, but only that the average difference between estimated uninjured earnings and actual earnings will be an unbiased measure of average losses.

7. Fraudulent reporting of injuries would be the converse of underreporting. However, there are no studies that indicate that overreporting is nearly of the same magnitude as underreporting.

8. Cheit drew this conclusion from looking at predicted and actual postinjury earnings of individual workers. This finding suggests that a substantial number of workers had little or no work-related lost earnings. However, findings for individual workers are subject to substantial uncertainty. See note 12.

9. Uninjured workers could not be used in the regression context because personal characteristics controlled for in this setting (for example, age and gender) are unavailable for the uninjured workers.

10. To account for the losses of workers out for 8–10 days, they added 9 days’ wages to each worker’s estimated losses.

11. This includes a 2.3 percent discount rate. Also, in the 1999 Wisconsin study, Boden and Galizzi imputed changes in the employment rates of uninjured workers over time as they might affect losses. The other studies did not do this, so, for sake of comparison, we omitted this step.

12. Determining the true losses of individual workers is virtually impossible because, at the individual level, we cannot know what factors caused changes in earnings. Only by estimating losses of large groups of workers can we apply statistical techniques that “average out” the noninjury causes of changes in earnings.

13. The relatively low replacement for the group under 15 days is caused by the fact that this group is not paid benefits for the first 3 days off work. Once 15 days is reached, the first 3 days’ benefits are paid.

14. Initial match quality was judged by how well earnings of injured and matched uninjured workers tracked each other in the prematch period. Match quality was excellent in New Mexico and insured firms, but less so in the other three states and self-insured firms in California. To improve match quality in these cases, uninjured workers were matched by employee tenure in addition to employer and preinjury wages.

15. In Washington, on the basis of the average over the last 4 quarters observed (quarters 11–15), we project a 1.9 percent quarterly decline in wage losses after the last quarter observed. In California, we project a 1 percent decline after the last quarter observed, which is also based on the last quarters observed. In Wisconsin, almost 10 years of postinjury earnings are directly observable. In Oregon, the data suggest that no decline in wage losses is occurring at the end of the observed period.

16. Because New Mexico has a seven-day waiting period and the other states have three-day waiting periods, we do not include it in this comparison.

17. California permanent disability recipients have the longest temporary disability durations. Using deciles instead of actual durations controls for differences across workers’ compensation systems that might extend or reduce the durations of temporary disability, such as the level of benefits or control over medical
care or levels of litigation. If true severity were the only determining factor of temporary disability durations across states, because California has the highest durations, this approach (using deciles instead of durations) would overstate the fraction that would receive permanent disability benefits if they had been injured in California. On the other hand, California may not award permanent disability randomly within long-duration temporary disability groups. Rather, permanent disability may be awarded to workers within these groups likely to have the largest lost earnings. In this case, our method would underestimate the losses among workers in other states who would have received permanent disability benefits in California because we randomly chose workers within temporary disability groups.

18. Several of these questions are adapted from another agenda for research on workers’ compensation adequacy published in an appendix to Hunt (2004).

References


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Workplace Injuries and Diseases
Prevention and Compensation

*Essays in Honor of Terry Thomason*

Karen Roberts
John F. Burton Jr.
Matthew M. Bodah
*Editors*

2005

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