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**Adequacy of Earnings Replacement in Workers' Compensation Programs: A Report of the Study Panel on Benefit Adequacy of the Workers' Compensation Steering Committee, National Academy of Social Insurance**

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# Adequacy of Earnings Replacement in Workers' Compensation Programs



NATIONAL  
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INSURANCE

National Academy of Social Insurance  
Study Panel on Benefit Adequacy

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## **A Report of the Study Panel on Benefit Adequacy of the Workers' Compensation Steering Committee**

National Academy of Social Insurance

H. Allan Hunt  
*Editor*

2004

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

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## Preface

This volume is the result of several years of collaboration by a dedicated group of volunteers, who are listed at the back of this book. The NASI Study Panel on Benefit Adequacy was originally convened in the spring of 1998 under the chairmanship of Allan Hunt. After reviewing and discussing the available research and developing a tentative report outline, members volunteered to draft specific chapters. We elected not to identify authorship, since all material has been extensively reworked through subsequent Study Panel deliberations and redrafts. Each Study Panel member contributed to this process in his or her own way. However, the “heavy lifting” was done by Les Boden, John Burton, Allan Hunt, Virginia Reno, Emily Spieler, and Terry Thomason. We also thank Virginia Reno, Dan Mont, Cecili Thompson Williams, Sue Berkebile, and Nelly Ganesan for invaluable administrative support. NASI reviewers included Monroe Berkowitz, Jerry Mashaw, and Ed Welch. Our collaborative process was interrupted by the shocking illness and death of our colleague Terry Thomason in 2002. We dedicate this volume to his memory.



# 1

## Introduction

This study was sponsored by the National Academy of Social Insurance (NASI) under the auspices of its Workers' Compensation Steering Committee. NASI regularly convenes steering committees and study panels charged with conducting research, issuing findings, and, in some cases, making recommendations based on their analyses. Members of these groups are selected for their recognized expertise and with due consideration for the balance of disciplines and perspectives appropriate to the project. Findings and recommendations of the groups are the responsibility of the individual group members, not NASI, its members, or its supporters. In 1998, NASI convened a study panel of its Workers' Compensation Steering Committee (see p. 145 for a list of panel members) to review the earnings replacement benefits under the various state and federal workers' compensation programs for workers injured or made ill by their jobs.

The Benefit Adequacy Study Panel's task was to examine the extent to which workers' compensation wage replacement benefits paid to injured workers replace their lost wages, and to assess the adequacy of wage replacement. Replacement of lost wages is acknowledged as one of the primary objectives of these programs, but it has not been studied extensively until the last few years. Of course, we recognize that benefit adequacy is not the only important issue in workers' compensation policy. Moreover, some states provide certain benefits for reasons other than wage replacement. The fact that this report focuses exclusively on benefit adequacy reflects the overall approach the NASI Workers' Compensation Steering Committee has taken to reviewing the various policy issues in workers' compensation programs.

We also understand that a variety of policy and behavioral factors may influence the extent to which lost earnings are replaced by a workers' compensation program. These include the benefit structure specified by statute, the extent to which systems encourage reduction in the level of losses, and the extent to which procedural and operational characteristics affect workers' recoveries. Examples of these include the cost of obtaining benefits, compromise and release agreements, and

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procedures for terminating benefits. These factors, and many more, interact in complex and sometimes unpredictable ways with wage replacement benefits in a workers' compensation system. In particular, we are not asserting that adequacy of benefits alone would ensure a high-quality workers' compensation system.

Two recent developments have made this inquiry timely: first, a series of changes in workers' compensation statutes through the decade of the 1990s, generally designed to take costs out of the system; and second, a group of empirical studies that promise to provide better information than we have had before about actual replacement of wage losses by workers' compensation systems. Critics of the statutory changes in the 1990s believe that these changes may have significantly undermined the adequacy of workers' compensation benefits (Spieler and Burton 1998). They argue that changes in workers' compensation statutes in the period from 1992 to 1998 reduced the amount and duration of cash benefits, changed the rules on compensability to make recovery more difficult, altered the way disability is assessed, and made other changes that made it more difficult to qualify for benefits.

Supporters of these statutory changes do not agree that they resulted in significant benefit reductions. They argue that in most states benefits increased, and even in the few states that reduced benefits for some types of claims, they often increased them for others. Moreover, supporters argue that the benefit reductions usually were made to bring benefits in line with the norms in other states. Proponents also argue that these changes placed greater emphasis on prevention, increased reliance on objective determinations of disability and compensability, created new tools for preventing and resolving disputes, and eliminated mandates, such as for vocational rehabilitation, that were not cost effective.

Interest in the issue of benefit adequacy was also stimulated by a series of "wage loss" studies conducted in California, Wisconsin, Washington, New Mexico, and Oregon in the last five years. The data and methods used in these studies constitute a significant breakthrough on the comparison group problem. Using electronic administrative records of earnings, it is possible to develop more adequate comparison groups to answer the counterfactual question, "What would injured workers have earned in the absence of their injuries?" In other words, it is now possible to more accurately estimate the lost earnings that workers' compensation benefits are designed to replace.

The NASI Benefit Adequacy Study Panel reviewed the published research literature on benefit adequacy and then formulated an approach to this difficult and contentious issue. During a series of meetings held over a five-year period, the study panel determined that it would be useful to produce a report reviewing what was known, and what was not known, about benefit adequacy in workers' compensation programs. Members of the panel volunteered to prepare draft chapters, which were reviewed and discussed by the entire panel. The draft report was then peer reviewed according to the procedures of the NASI Board of Directors. This book represents the result of that deliberative process.

## **PLAN OF THE PRESENTATION**

The remainder of Chapter 1 consists of a brief overview of workers' compensation programs. Chapter 2 explores alternative meanings of benefit adequacy. What are the conceptual issues involved in assessing benefit adequacy? Do other social models exist for evaluating benefit adequacy? How do the unique features of state workers' compensation programs complicate things when considering benefit adequacy?

Chapter 3 addresses the methodological issues involved in determining benefit adequacy. What data are available to measure benefit adequacy? Why is it so difficult to estimate what injured workers' earnings would have been in the absence of injury? How do the methodological choices influence the outcome of the analysis?

Chapter 4 traces the statutory benefit structure among the state workers' compensation programs over the period 1972–1998 to assess the “intent” of legislators in providing earnings replacement benefits. It compares benefit levels for standard situations among the programs, and also uses the workers' compensation “Model Act, Revised” promulgated by the Council of State Governments in 1974 as a benchmark. The Model Act was designed to provide guidance to state legislatures on good legislative practice in workers' compensation. It incorporated the recommendations of the National Commission on State Workmen's Compensation Laws (NCSWCL 1972).

Chapter 5 describes the recent wage loss results from California, Wisconsin, Washington, New Mexico, and Oregon. These studies are based upon the pre- and postinjury earnings of actual workers. They

employ various techniques to derive a comparison group of noninjured workers that is used to estimate the earnings that the injured workers would have received in the absence of injury. These empirical methods are found to produce the most convincing assessment yet of benefit adequacy in workers' compensation programs.

Finally, Chapter 6 reviews the findings of the study and provides the panel's conclusions on benefit adequacy in workers' compensation programs. An appendix to the chapter presents thoughts on the need for further research.

### **A BRIEF HISTORY OF WORKERS' COMPENSATION PROGRAMS**

Workers' compensation programs provide wage replacement, rehabilitation, and medical benefits to workers with work-related injuries and occupational diseases. They also pay survivor benefits to dependents of workers who die as a result of such injuries. In 2001, benefit payments for workers' compensation totaled \$49.4 billion, or a little more than \$500 per covered worker (Williams, Reno, and Burton 2003).

#### **Origins of Workers' Compensation**

Workers' compensation laws did not appear in the United States until the early part of the twentieth century. Prior to the enactment of these laws, the only avenue available for injured workers seeking compensation for a work-related injury was to bring a tort liability lawsuit against their employers. Common law principles established that employers had a duty to not injure their workers, to warn them of risks, and to provide a reasonably safe environment. In practice, securing common law redress for injuries was very difficult. The worker had to establish that the employer was negligent, and even a negligent employer could use three types of defenses that usually precluded a finding of liability:

- 1) *Fellow servant rule*. This held that an employer was not liable for an injury caused by the negligence or carelessness of fellow employees.

- 2) *Contributory negligence*. This held that the employer had no responsibility to the injured worker if the negligence of the employee contributed to the cause of the accident, even if her contribution was minor.
- 3) *Assumption of risk*. Where the employee is considered to implicitly accept all obvious and customary risks of her occupation. Wages were considered to take the increased risk of injury into account.

To the extent that these defenses were persuasive in a court of law, common law remedies were received by relatively few workers.

As the number of accidents rose in the latter part of the nineteenth century, legislative efforts were made to limit employer common law defenses. Such statutes, however, still clung to the common law theory that employers were only responsible for their direct negligence. These “employer liability” laws generally served three purposes (Somers and Somers 1954, p. 21):

- 1) making it illegal for employers and workers to sign contracts relieving the employer of liability for accidents as a condition of employment (27 states by 1908),
- 2) extending the right of suit in death cases (41 states by 1904), and,
- 3) abrogating or modifying common law defenses, usually by eliminating the fellow servant doctrine. These laws generally applied to railroad workers, miners, and other occupations deemed particularly hazardous.

However, these statutes did not appease workers, who continued to fight for expanded responsibility of employers. Employers, too, were dissatisfied with these laws. They faced large legal expenses and a good deal of uncertainty, both financially and in the stability of society at large. Numerous commissions were formed to investigate these issues and generally reached the following conclusions about the employer liability system as it existed at that time (Somers and Somers 1954; Hobbs 1939):

- 1) The system was antiquated, as it was designed in the preindustrial era, when both the organization of production and the types of employment were different.

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- 2) The benefits provided were inadequate, and there was uncertainty as to whether a worker was eligible to receive them.
- 3) The system was wasteful and had high costs to employers.
- 4) There were many delays.
- 5) Rewards were inconsistent.
- 6) There was a lack of prevention, although insurance companies at the time were introducing some preventive measures for certain employers.
- 7) The lack of a good system was creating a public burden.

In searching for a solution to these deficiencies, policymakers looked to Europe for an alternative system (Larson and Larson 2000). As early as the 1830s, Germany had been moving toward a social insurance model, but it came to its fruition under Bismarck in the late 1880s and was adopted in Britain about a decade later. The basic idea of this model was that employers and employees would jointly pay for insurance that would provide benefits for people with disabilities, regardless of the cause.

Unlike in Germany, however, the United States adopted this model only for workplace accidents. So employers alone contributed to insurance costs, but only for injuries resulting from accidents in the workplace. Eventually, workers' compensation coverage was extended to disability due to occupational diseases as well.

Workers' compensation benefits are nontaxable. In the early years of the twentieth century, this was not much of an issue (the federal income tax dates only to 1912), but with federal income taxes, state income taxes, and payroll taxes easily taking one-third of gross earnings today, this is a very significant factor. Most workers' compensation systems today pay wage replacement benefits based on gross wages, although a minority have switched to benefits based on net earnings or after-tax wages in the past decade.

Another important feature of this system was that workers' compensation programs became the "exclusive remedy" for work-related injury and illness. That is, as a tradeoff for receiving no-fault workers' compensation benefits, workers were no longer allowed to sue their employers for damages resulting from negligence in the workplace. By accepting this "historic compromise," workers were guaranteed benefits for work-related injuries and illnesses (putting aside, of course, disputes

about what constituted a work-related condition). Employers had their potential liability limited to the benefits provided under workers' compensation programs, regardless of their culpability for the injury to the worker. Moreover, their exposure to the costs of illnesses and injuries was much more predictable under the workers' compensation plan.

By 1920, all but eight states had a workers' compensation law. The 48th state, Mississippi, enacted its law in 1948. Over the years, through legal interpretation and legislative enactment, workers' compensation statutes have been expanded to include near universal coverage and inclusion of many conditions which were not originally thought to be employment related (including stress, mental disabilities, repetitive strains, and occupational diseases).

### **National Commission on State Workmen's Compensation Laws**

In the United States, there is a heavier reliance on private benefit programs than in other developed countries. Most social insurance programs that do exist are federal, and federal law encourages state adoption of unemployment insurance programs. This is not the case for workers' compensation programs, in part because they began prior to the 1930s, when the U.S. Supreme Court reinterpreted the interstate commerce clause of the Constitution to allow federal regulation of private sector employers (*NLRB v. Jones & Laughlin Steel Corp.*, 301 U.S. 1 (1937)). In 1970, Congress established the National Commission on State Workmen's Compensation Laws to "undertake a comprehensive study and evaluation of State workmen's compensation laws in order to determine if such laws provide[d] an adequate, prompt, and equitable system of compensation" (29 USC 676(a)(1)). In addition, the commission was directed to determine if there was a role for federal legislation to improve these programs.

In 1972, the commission made a series of "essential" recommendations, including:

- 1) Workers' compensation should be compulsory rather than elective.
- 2) Employers should not be exempt because of the number of employees or because workers are agricultural employees, government employees, or casual or domestic workers.

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- 3) Full coverage should be provided for work-related diseases.
- 4) The maximum weekly wage benefit should be at least 100 percent of the state's average weekly wage, and cash benefits for temporary total disability should be at least two-thirds of a worker's gross weekly wage.
- 5) Workers' compensation programs should not impose arbitrary limits on the duration or total amount of benefits.
- 6) Workers' compensation programs should provide adequate medical care and rehabilitative services.

Over the decade or so following the commission's report, most states improved their compliance with these (and other) recommendations. However, a biannual U.S. Department of Labor publication that tracks state compliance with the recommendations of the commission indicates that states, on average, only complied with 12.9 of the 19 "essential recommendations" as of January 1, 2002 (U.S. Department of Labor 2002).

### **ATTRIBUTES OF A WORKERS' COMPENSATION PROGRAM**

Receiving workers' compensation benefits for a work-related injury or illness depends on two factors: coverage and compensability. In other words, is the job the worker holds covered by workers' compensation laws, and is the injury or illness considered work-related? If the answers to both of those questions are in the affirmative, then the remaining issue is the amount of benefits to be paid. The answers to all these questions vary depending on the state in which the worker is employed, works, or is injured, and can be quite complex. This section provides a general description of some of the provisions found in workers' compensation programs and some of the issues involved.

#### **Coverage**

Most workers in the United States are employed in jobs that fall under the umbrella of workers' compensation protection. In 2000, that amounted to an estimated 126.6 million persons, or about 97 percent of

all employment (Mont et al. 2002, Table 3). Indeed, coverage is mandatory in every state except for Texas. Even in Texas, 84 percent of workers are covered (Shields and Campbell 2001, p. 1).

However, all states allow for some exceptions. For example, in some states workers in very small firms are excluded. Also, agricultural workers, household workers, employees of charitable or religious organizations, and some units of state and local government are exempt from coverage requirements in certain states. Self-employed persons are also generally not covered in U.S. jurisdictions (see U.S. Department of Labor 2002).

### **Compensability**

Compensability rules define which injuries or illnesses qualify a worker for workers' compensation benefits. Statutes pertaining to compensability, and the administrative procedures and court cases interpreting them, are extremely complex and involve many nuances. An injury or illness is only compensable if it is found to be "work-related" based on certain legal tests. In most states, the work-related requirement for an injury involves four specific tests. There must be 1) a personal injury, 2) by accident, 3) which arises out of employment, and 4) in the course of employment. (See Larson and Larson [2000] for a thorough and authoritative treatment of these issues.)

The "personal injury" requirement has been interpreted in some states to only cover conditions with either a physical cause or a physical consequence, thus excluding many mental illnesses. The "by accident" requirement when construed strictly usually requires that the accident involve a definite time and place and that the cause of the accident be fortuitous. Courts in some states have held that the "by accident" requirement is met if the result is unexpected, not just the event. In most other jurisdictions, special provisions have been enacted to compensate injuries not attributable to a single event and for occupational diseases.

The "arising out of employment" test means that the source of the injury must be related to the job. This test is used to distinguish among three types of risk that may result in an injury to an employee at the workplace: 1) occupational risks, which are universally compensable; 2) personal risks, which are universally noncompensable; and 3) neu-

tral risks, where the cause of the injury is neither distinctly occupational nor distinctly personal, or where the cause is unknown, which may or may not be compensable depending on the legal doctrine used in the particular state and the specific facts of the case.

An example of an occupational risk is a worker injured by a malfunctioning machine. An example of a personal risk is a worker shot by an angry spouse who sneaked into the worksite to vent her rage. An example of a neutral risk is a worker struck by lightning while he sweeps the floor in a convenience store. He will meet the “arising out of employment” test in a state that uses the positional risk doctrine for neutral risks, but probably will not meet the test in a state that relies on the increased risk doctrine for neutral risks.

Of course, not all injuries and diseases are the result of a single cause. Thus, states have had to decide what degree of work contribution is necessary in order for the “arising out of” test to be satisfied. States vary in the degree of work contribution required. For example, state requirements vary from “any causal effect” to requiring that work contribution be “significant” or “substantial” or even the “predominant” cause of the injury or disease.

A related (but not identical) issue is whether or to what degree the employer should be responsible for the total cost of disability when the disability is the result of the combined effects of a preexisting condition and a work injury. The historical general rule was that the employer took the worker as he entered the plant gate. Thus, if a work injury combined with a preexisting condition to produce disability, the employer was responsible for the full workers’ compensation benefit for that disability. However, some states do not believe it is fair to require the employer to pay for the full disability when the work injury was only partly responsible. These states apportion between work and preexisting contributions and reduce the cash benefit accordingly or pay no benefits for injuries where work causation was uncertain or minimal.

The “course of employment” test normally requires that the injury occur on the employer’s premises and during working hours. Thus, an assembly line worker who is injured in an automobile accident on the way to work will not meet the course of employment test. However, a salesperson injured while driving to a client is likely to meet the test. The “course of employment” test is also used to decide whether injuries that result from mixed social and business activities are work related. A

law clerk who is encouraged to participate in an employer-sponsored softball game and injures her hand diving for a fly ball may meet the course of employment test, at least in some states.

Determining whether an illness or disease is work related is even more challenging in other cases. In most states, occupational diseases and back disorders (which, from a medical standpoint, are often the result of disease or normal aging) were evaluated using the four tests for injury compensability. Historically, many occupational diseases could not meet these four tests, particularly the “by accident” test, which was often interpreted as requiring a definite time and an explicit source.

As a result, all workers’ compensation statutes established separate criteria for determining the compensability of diseases. Typically a list of occupational diseases and sources of exposure for these diseases are spelled out in the statute, and if the worker can demonstrate that his or her disease is on this list, the work-relatedness test is met. For a worker who has a condition not on the list, there are legal tests for establishing a work relationship found in most statutes, such as a requirement that the disease be “peculiar to the worker’s occupation.” Thus, a nurse who contracts pneumonia from a patient may qualify for workers’ compensation benefits, while an office worker who contracts pneumonia from a fellow worker may not qualify.

## **Benefit Levels**

Benefit payments for workers’ compensation typically include full compensation for all related medical costs as well as wage replacement benefits designed to replace some portion of lost earnings. Medical benefits typically pay for all reasonable and necessary medical expenses but are only provided for conditions that are related to the injury or illness in question. In approximately 76 percent of workers’ compensation cases, only medical benefits are received (National Council on Compensation Insurance 1998). These “medical-only” cases do not involve compensable amounts of time away from work, and are mostly minor injuries; they account for only 6 percent of all benefits paid.

Payments designed to replace lost wages are more complex and depend on the nature of the disability as well as the jurisdiction. Is it permanent or temporary? Is the disability considered partial or total? Most wage replacement cases in the workers’ compensation system involve

temporary total disability (TTD). To qualify for TTD benefits, workers typically must meet some threshold of lost time from work. This threshold ranges from a minimum of 3 days to a maximum of 7 days among U.S. jurisdictions. After a certain number of days (usually 14 to 21), benefits are paid retroactively for the threshold period.

Usually TTD recipients return to work upon medical recovery and do not receive any permanent disability benefits. Occasionally, they return to work prior to the date of maximum medical improvement (MMI) with a reduced work schedule, or altered responsibilities and at an accompanying lower wage. In these instances, most states provide temporary partial disability (TPD) benefits. Cases classified as temporary disabilities (either total or partial) account for nearly 70 percent of workers' compensation cases where wage replacement benefits are received.

The most difficult and contentious category of benefits is permanent partial disability (PPD) benefits. In these cases, the disability is considered permanent but not severe enough to preclude work. PPD benefits are usually paid to workers who initially receive TTD benefits, but after the date of MMI still have a partial work disability.

There are typically two different types of PPD benefits, scheduled and nonscheduled. Scheduled benefits are for injuries involving specific body parts (such as arms or legs) that are included in a "schedule" in the workers' compensation statute. In most states, physical loss or loss of use of these body parts automatically qualifies the worker for benefits. However, there is no consistency among the states in the amount of benefits awarded for different body parts. Some states provide greater benefits for loss of an arm than a leg, and others are just the reverse.

States also differ in the purpose cited for schedule benefits. Some of those that tie the schedule benefit to the injured worker's average weekly wage characterize the schedule as a form of presumptive wage loss used to facilitate administration of the law. In most states, the schedule is the only permanent partial benefit payable to someone with an injury on the schedule. However, there are a few states in which the schedule benefit is a minimum, and if continuing loss of wages can be shown, additional cash benefits will be paid. In addition, a few states have schedules that do not tie the benefit entitlement to the injured worker's average weekly wage. In those cases, the schedule seems more like a sickness and accident schedule than one designed to compensate for lost earnings.

Nonscheduled benefits are for injuries that are not included in the schedule (such as back injuries). The system for determining benefits in these cases is very complex and varies considerably across jurisdictions (see Barth and Niss [1999] for a thorough treatment). Some states provide benefits based on an impairment rating scheme. The level of impairment, often expressed as a percentage of full functionality or “whole body,” is sometimes translated into a percentage of total disability. This percentage is then used to determine the benefit amount. Some states modify the impairment rating to try and account for loss of earning capacity by adjusting for vocational factors, such as the worker’s education, job experience, and age. Other states employ a system that attempts to compensate workers for actual lost wages. In addition, many states use combinations of these methods that have evolved over the last 90 years.

Although PPD benefits contain the term “permanent,” they do not always last the length of the recipient’s expected working life. Often, PPD benefits are awarded for a set length of time (scheduled benefits nearly always are for a specific number of weeks), and that period can differ within a given state depending on the degree of the disability or other factors. The duration of benefits may also depend upon the worker’s situation. In most jurisdictions, PPD benefits are based on a one-time estimate of what the injured worker’s future loss of earnings will be over the remainder of his or her working life. This estimate by its very nature is fraught with uncertainty.

Most jurisdictions will pay these PPD benefits even if the injured worker does not suffer an earnings loss after the condition has become stable (after MMI). There is much disputation over the specific worker’s circumstances and the resulting workers’ compensation entitlement, and many of these claims end up with compromise settlements. PPD claims account for approximately 28 percent of all cases with wage replacement benefits. Nevertheless, in terms of benefits paid, PPD cases are the most expensive category because more than 63 percent of wage replacement benefits paid are for PPD cases (Mont et al. 2002, Figure 3).

If the disability is severe enough, the worker can receive permanent total disability benefits (PTD). In most states there are some injuries that are presumed to be permanently and totally disabling, such as the loss of two eyes or two arms. In these cases, PTD benefits are paid presumptively. The worker does not have to prove that she is unable to

work. Generally, workers can receive PTD benefits if an illness or injury is deemed significant enough to preclude any gainful employment. But in a few states, PTD benefits are payable if the worker is unable to resume her prior employment, even if employment in another occupation is possible.

Sometimes these determinations take into consideration geographical, educational, and economic factors. An injured person might be able to do some sort of work, but given his education, experience, and the job opportunities where he lives, nonemployment may be the most reasonable outcome. In these instances, PTD benefits can be taken away or reduced if the recipient does return to work. Less than 1 percent of all workers' compensation cases are classified as PTD.

Fatal benefits go to dependent family members of workers whose death is caused by a work-related injury or illness. There are frequently no benefits associated with the deaths of workers who do not have any dependents, although burial expenses may be paid, and usually a "penalty" payment to the workers' compensation administrative entity is assessed. This provides a financial incentive for prevention efforts by the employer. Less than 1 percent of all workers' compensation cases involve fatalities.

Sometimes instead of receiving weekly or monthly wage replacement benefits and fully paid medical care, workers negotiate a settlement (also referred to as a compromise and release agreement) with their employers and/or insurers. Such an agreement is often made in cases where the compensability of an injury is in dispute. Settlements are also common in cases where the parties disagree about the amount of benefits due in the future for an admittedly compensable injury because the amount is subjective, or difficult to ascertain in advance.

The settlement typically provides the worker with a one-time payment that represents the amount agreed to (the compromise) as the worker's recovery. Settlements where compensability is disputed, however, recognize that there is a possibility that the worker may not receive any recovery and therefore are usually more deeply discounted. A settlement generally limits or terminates the employer's liability (the release). Thus, it is a "compromise" agreement that "releases" the employer from liability, or a "compromise and release." The rules governing such settlements vary widely, with some jurisdictions not allowing them at all, some allowing them only under specific circumstances, and

some being fairly free with approval of such agreements. Most states are careful to not approve settlements that make insufficient allocations for future medical expenses, or they allow for the medical part of the settlement to be reopened if need be.

There is another group of settlements that reflect litigation over the degree of disability or the residual work capacity of the injured worker. Such cases revolve around the medical aspects of the case (especially causation) and the implications for the future work capacity of the individual. These disputed cases can involve very expensive and time-consuming litigation within the overall administration of this no-fault insurance system.

## **Insurance**

Employers secure workers' compensation insurance coverage in three ways. They may buy a policy from a private insurance carrier, they may insure with a state fund, or they may self-insure (either individually or as part of a group arrangement). However, all of these options are not available in every state. About 20 states have state funds that compete with private insurance carriers. Five states (North Dakota, Ohio, Washington, West Virginia, and Wyoming) have "exclusive" state funds and do not allow employers to purchase private insurance. The rest of the states rely on private carriers and self-insurance only. Whatever insurance arrangement is used, however, the laws governing coverage, compensability, and the amount of benefits paid are the same within a state.

## **Recent Policy Developments**

Since the National Commission's report in the 1970s, the state workers' compensation programs in the United States have gone through a number of stages, driven by both political and economic forces. The report held out the threat of mandatory national standards if the states did not improve their programs to comply with 19 "essential recommendations." The states did make a significant effort to comply, and through the decade of the 1970s benefits generally were increased and eligibility was expanded.

One example is given by the level of maximum benefits for TTD. The commission recommended that the maximum benefit should be set

to at least 100 percent of the state average weekly wage. When the commission endorsed this goal in 1972, only one state was in compliance. By 1979, 28 states had attained this level (Thomason, Schmidle, and Burton 2001, p. 23). But as benefits improved, employers' costs rose accordingly. Thomason, Schmidle, and Burton (2001) report that employer costs of workers' compensation insurance rose from 1.11 percent of payroll in 1971 to 1.95 percent in 1979, while benefits increased by nearly 16 percent annually.

Many in the business community, including some initial supporters of the essential recommendations, opposed further adoption at this point because the cost impact was greater than they originally anticipated. This was the result of behavioral changes that led to greater utilization combined with continued cost pressures from PPD benefits and the perceived need for improvements in the delivery system and adjudicatory process which the commission did not address.

Employer costs as a percentage of payroll receded from 1980 to 1984, as investment earnings peaked in the insurance industry and the underwriting cycle permitted a return to profitability among workers' compensation insurers. Average employer costs declined from 1.95 percent of payroll in 1979 to 1.66 percent in 1984, and there were relatively few legislated benefit changes.

However, costs began to rise again in the mid 1980s, peaking at 2.16 percent of payroll in 1991 as benefits continued to rise faster than payrolls. Concerns about the rising employer burden of workers' compensation costs and the potential negative impacts on employment growth ushered in what has been termed "the neo-reform era" (Spieler and Burton 1998).

The period from 1992 to 2000 was characterized by a significant reduction in workers' compensation insurance costs for employers, declining from an average 2.16 percent in 1991 to 1.25 percent in 2000 (Thomason, Schmidle, and Burton 2001, Table A.1; Mont et al. 2002, p. 1). Spieler and Burton (1998) identified five causes of this decline:

- 1) reductions in cash benefits,
- 2) changing rules of compensability,
- 3) transformation of the health care aspect of workers' compensation benefits (managed care, etc.),

- 4) the rise of disability management, and
- 5) challenges to exclusivity.

Others disagree with the conclusions of Spieler and Burton and point out that cost declines occurred in states that had not made any of the identified changes. They believe that the decline in workers' compensation costs was more affected by a significant reduction in injury frequency and the rise of disability management programs that occurred in nearly all states, and even in the workers' compensation systems of other developed countries. This decline continued through 2000 in most jurisdictions and has not been satisfactorily explained.

Benefit replacement formulae were not generally changed during this period, although there were a few exceptions. Similarly, benefit maxima were not reduced; most of these are now tied to the state average weekly wage as the commission recommended. However, there were a few states that reduced the maximum number of weeks for TTD, which can affect benefit adequacy for longer duration cases. Business representatives point out that this change occurred in states where a significant number of TTD claims lasted for 18 months or more, a period of time beyond what is commonly considered "temporary." Overall, it would be fair to say that the thrust of workers' compensation amendments during the 1990s was to reduce system costs through a variety of benefit reductions, coverage limits, and administrative efficiencies.

However, according to Spieler and Burton, "The primary target for reform in the 1990s has been permanent partial disability benefits . . ." (p. 219). These benefits, the most difficult and controversial in the workers' compensation programs, are paid to individuals who are able to work but have sustained some permanent impairment. Reductions in the weekly amount of and maximum duration for benefits and changes in the way disability is assessed are two of the many techniques used during this period to reduce the cost of permanent partial disabilities for employers. Of course, changes such as these can have important implications for benefit adequacy.

Insurers point out that changes in the way disability was assessed were done to increase predictability in the determination of PPD, and they maintain that there is no evidence that these changes provided for any less benefit adequacy than the methods of PPD determination they replaced.

## CONCLUSION

The vast majority of workers in the United States are covered by state workers' compensation programs. These state programs differ widely in regard to coverage, compensability, benefit levels, and financing. They also differ in how they are administered and enforced. To fully understand workers' compensation programs and their role in assisting those with work-related injuries and illnesses, it is important to review the programs by comparing and contrasting the experience across states.

This book focuses on the adequacy of wage replacement benefits paid by these programs. It does not examine the medical benefits provided by workers' compensation programs, nor does it address the important issues of coverage or compensability. Thus, it will not analyze the extent to which workers' compensation programs provide benefits to all people who are injured while working or who contract an occupational disease. Rather, it examines the level of benefits provided to those workers who are covered by workers' compensation statutes and have an injury or an illness that meets their state's definition of a compensable condition.

Even within this more limited scope, however, there is much to be discussed. What is meant by benefit adequacy? What are the methodological challenges and analytical advantages of using different measures of benefits? And, finally, what summary judgment can we make about the adequacy of cash benefits in the current state systems? Have legislative enactments of the last decade damaged this important social safety net for working men and women? This book seeks to answer these questions in a balanced and rational manner. We acknowledge that emotions run high when discussing the adequacy of workers' compensation benefits, but we also maintain that facts speak louder than opinions. We have done our best here to present the facts about benefit adequacy.

## 2

# Alternative Meanings of Benefit Adequacy

Making a determination of benefit adequacy in a social insurance program requires measurement of both the losses suffered and the compensation received. It is the adequacy of the benefit received that we are after. But adequacy compared to what? In workers' compensation programs, generally it means that the wages and benefits lost during a period of absence from work due to a work-related injury or illness should be compared to the compensation payments received by the injured worker. But, which losses are to be included? And for what period of time? In designing such systems, it is necessary to strike a balance between equity and ease of administration. This chapter considers various methods for judging whether the compensation received is "adequate" in a social insurance setting.

Discussions of benefit adequacy in social programs imply that benefits paid to eligible beneficiaries can be measured against some objective standard. But benefit adequacy has no meaning independent of the stated goals and the social and political context of a particular benefit program. This chapter will put the discussion of workers' compensation benefit adequacy into a larger context by describing the nature of the losses suffered by injured workers and some approaches to addressing these losses that are used in various social programs.

We then describe the workers' compensation approach to benefit design and the commonly understood meanings of adequacy within the workers' compensation context. The following chapter adopts an operational definition of adequacy, discusses some of the difficulties in measuring adequacy, and summarizes methodological approaches to be followed in later chapters.

We offer some important initial caveats before beginning our examination of the meaning of benefit adequacy. First, we acknowledge that the idea of benefit adequacy in a social insurance program is subject to a wide variety of interpretations. We attempt here to describe some possible ways to measure adequacy and to explain the benchmarks for adequacy that we have chosen to apply in later chapters. We

recognize, however, that there is ample room for further debate regarding the fundamental question of how to assess adequacy. For example, measures of benefit adequacy may differ depending upon whether adequacy is measured by what the law provides or what benefits are actually received. We will explore this issue in Chapters 4 and 5. The point is that if the results differ, the reasons for the difference must be clearly understood.

In addition, we recognize that the measures of adequacy we suggest as appropriate are not perfectly addressed by the quantifiable benchmarks we apply in this book. There is a gap between the “ideal” and the “doable.” One reason is that the ability to measure adequacy has been compromised by the lack of adequate data. The relatively small number of studies, and limitations in existing data, mean that we still have an incomplete understanding of many issues regarding benefit adequacy in workers’ compensation programs.

We also recognize that there are legitimate political and economic arguments that may influence an assessment regarding appropriate benefit levels, in addition to the question of benefit adequacy. For example, some argue in favor of lowering benefits below commonly understood levels of adequacy, based on assessment of the effects of workers’ compensation costs on employers’ competitive positions and resulting employment effects. Others argue that benefits should be raised in order to increase employers’ incentives for improving workplace safety. For a third example, it is generally accepted in workers’ compensation that something less than 100 percent wage replacement is required in order to preserve the incentive to return to work. These arguments can be, and frequently are, couched in terms of benefit adequacy. For example, one might ask, “Are benefits adequate to create meaningful incentives to promote safety?”

In this book, the approach to the question of benefit adequacy has been reduced to the narrower question of the sufficiency of wage replacement benefits to replace two-thirds of gross wages lost due to occupational injury or illness. This is the historical workers’ compensation standard and is still relevant today, as 36 of the 50 states endorsed this benefit level for temporary total disability benefits under their workers’ compensation statute in 2002. However, this is not a trivial choice, and the panel debated long and hard about this issue.

Furthermore, we recognize that by using two-thirds of gross wages as our benchmark we are ignoring many of the program provisions that

affect this benchmark, including the fact that the two-thirds replacement is based in most states on wages at the time of injury and not estimated wage loss in the future. More importantly, we acknowledge that there is no consensus on two-thirds of lost wages as a standard of adequacy for permanent partial disability benefits. We also recognize that the two-thirds replacement rate test does not take into account the impact of replacing taxable wages with nontaxable workers' compensation benefits, which can be significant because the tax burden varies among the states and among workers with different preinjury income levels.

The National Commission on State Workmen's Compensation Laws (NCSWCL) endorsed a move to 80 percent of spendable earnings as a more equitable benefit level, considering taxes, fringes, work incentives, and all the other issues (Recommendation 3.1). But as the commission put it, "A perfect balance of these contending interests can not be reached by a scientific formula or any other means" (NCSWCL 1972, p. 53). We note also that the commission endorsed a "transitional formula," which should be used "until the maximum weekly benefit in a State exceeds 100 percent of the state's average weekly wage" (NCSWCL 1972, p. 57). This transitional formula was the traditional two-thirds of the gross weekly wage.

Broader approaches lead to discussions in which benefit adequacy, in this sense, may be weighed against other program factors. These are the critical questions in the *realpolitik* world of workers' compensation legislation. Balancing employer and worker interests while accomplishing the implicit social objectives of workers' compensation programs is no small feat. Nor are these issues irrelevant to the issue of wage replacement benefit adequacy.

For example, how should an employer-provided wage continuation plan or paid sick leave be factored into the benefit adequacy question? If an employer causes the worker to be paid during the waiting period for wage replacement benefits, or pays supplemental weekly benefits or a disability pension, how should this be credited against benefit adequacy? And how should receipt of benefits from other employer-funded or partially employer-funded government programs such as unemployment insurance, short-term disability programs, or Social Security be taken into account? The answer is particularly challenging because it depends on personal value judgments. However, we do not have the means of measuring these supplemental sources of income to injured

workers. So, as a result of these differences of opinion and data constraints, we are satisfied with measuring benefit adequacy by the historical two-thirds gross wage replacement standard.

Last, we note that our investigation of benefit adequacy can only address the benefits that are actually paid to those workers with injuries and illnesses that have been held to be compensable within the workers' compensation systems. Many workers with apparently compensable injuries never file for benefits (Biddle et al. 1998; Michaels 1998; Pransky et al. 1999; and Morse, Dillon, and Warren 2000). Others may have their claims disallowed for various reasons. Still others may be compensated for injuries that are not work related, or may fail to return to work when they are able. In short, we take the workers' compensation system at face value. If the system has found a claim to be valid, we accept that. If the system has denied a claim, so be it.

Tightened eligibility rules in some states may mean that workers with injuries and illnesses that previously would have been compensable may no longer be eligible to receive benefits (Burton and Spieler 2001; and Spieler and Burton 1998). These changes were sought by employers concerned that injuries and illnesses were being held compensable when work factors played only a minor role in causation, or when employers believed that no work relationship existed. For these workers, the costs of injury and disease may be borne by other social programs, and/or by the workers and their families. Our discussion of wage replacement benefit adequacy pertains only to the population of workers who apply for and receive workers' compensation benefits.

In order to assess benefit adequacy in workers' compensation programs, four questions must be addressed. First, what are the incurred losses that are attributable to occupational injury and disease? Second, what are the possible approaches to the replacement of these losses? The discussion of these questions provides a context for the more focused discussion of workers' compensation benefits that follows. Third, what is the statutory workers' compensation approach to the replacement of losses? In answering this question, we explore the historical and current understandings of workers' compensation benefits. Fourth, what benchmarks are available to measure adequacy of workers' compensation benefits, and what will these measures tell us about

the adequacy of benefits? This last question is addressed more fully in Chapter 3.

## **WHAT LOSSES DO WORKERS INCUR AS A RESULT OF OCCUPATIONAL INJURY OR DISEASE?**

### **Economic Losses**

The consequences of illness or injury can be divided into “economic losses” and “noneconomic losses.” Economic losses include all direct monetary loss. For injured workers, these include medical and associated rehabilitation costs associated with the injury (or illness), loss of earnings, and what we will call “nonwork losses.”

#### **Medical and rehabilitation costs<sup>1</sup>**

After an injury occurs or an illness develops, the worker will incur monetary costs associated with treatment. This includes curative treatment, designed to cure or ameliorate the level of impairment that results from the injury or illness (e.g., surgery to set a broken bone), as well as palliative care, designed to limit the ongoing effects of impairments (e.g., pain medication for chronic pain). In addition, various costs may be incurred to restore the ability of the worker to function at home and at work despite impairment. This may include medical rehabilitation (e.g., prostheses or other assistive devices), vocational rehabilitation (e.g., education and training for a changed employment situation), and other expenses.

#### **Loss of earnings and nonwage compensation**

As a result of injuries and illnesses, workers also lose earnings and associated benefits.<sup>2</sup> These losses include wages (regular hourly or salaried wages, overtime, bonuses, etc.) and a wide range of nonwage benefits (most importantly, health insurance and retirement pension benefit, but sometimes also access to child care, education and training, counseling services, etc.). Such losses can also trigger future losses. For example, reduced current pension contributions can significantly

lower postretirement pension income, loss of earnings can reduce Social Security benefit rates (both disability and old age), and loss of health insurance can result in subsequent large health care expenditures for the worker and his or her family, especially if routine preventive care is deferred.<sup>3</sup>

Business representatives also point out that injured employees on workers' compensation benefits often have reduced expenses, such as commuting, child care, food, and clothing costs. Moreover, business representatives point out that purchasing power also plays a role in the adequacy of benefits. States that have a large number of foreign workers (e.g., Alaska) have had concerns, leading in some cases to corrective legislation, about workers who are injured in their jurisdiction but then relocate to other areas that have lower costs of living and lower wage rates for similar work. This can result in benefits that might not meet the adequacy standard in the state of injury, but create a strong disincentive to return to work given where they have relocated.

### **Nonwork losses**

Economic losses for an injured worker may extend beyond the obvious wage and benefit categories as well. Examples of other potential economic losses include costs of nonwork activities, such as housework, home maintenance, or child and elder care, which the injured worker can no longer provide and now must pay to have performed. In addition, loss of another family member's income because they are required to provide care for the injured worker would be an economic loss that should be designated a nonwork loss. Such losses, which are rarely compensated under workers' compensation statutes, may nevertheless constitute a major change in the lifestyle or economic status of the injured worker and his or her family.

### **Noneconomic Losses**

In addition to wage stream interruption and specific monetary losses, injured workers may suffer a variety of other losses resulting from occupational injuries and illnesses. These noneconomic losses are generally more subjective in nature than the economic losses discussed earlier. Examples include the "pain and suffering" resulting from the in-

jury or illness, loss of enjoyment or quality of life, loss of ability to perform important nonremunerative activities such as house or yard work, and loss of the ability to engage in recreational or social activities. Of course, we understand that compensation for these losses was given up in the “historical compromise” in exchange for more certain benefits, including partial wage replacement.

## **POSSIBLE APPROACHES TO DETERMINING ADEQUACY**

Three possible approaches to determining adequacy are described below: 1) the personal injury model, 2) the loss of earnings model, and 3) the social adequacy model. We will examine each of these in turn.

### **The Personal Injury Model**

The civil justice system allows injured individuals to seek full replacement of both economic and noneconomic losses when they can successfully argue in court that someone breached a duty of care that was owed to them. In most of these cases, full replacement does not actually occur because the individual bears the costs involved in obtaining his recovery, including attorney fees. Of course, in order to determine adequacy of benefits under a model that includes all economic and noneconomic losses, noneconomic losses must be quantified in some way. In the personal injury system, this is typically left to the jury to decide. Quantification of these losses might derive from workers’ assessments of loss of quality of life (see Sinclair and Burton 1995), workers’ compensation impairment models not tied to wages (e.g., in Oregon and Alaska), or studies of damages awarded by juries in personal injury trials.

Although we regard this as an important area of inquiry, we put it aside as beyond the scope of this book. The lack of easily accessible and defensible benchmarks creates a difficult barrier to measuring these losses. Further, as we discuss in the following section, workers’ compensation was not developed as a system intended to replace noneconomic or nonwork disability losses, but as a no-fault system for rapid

and certain compensation for the economic consequences of workplace injuries and illnesses.

### **The Loss of Earnings Model**

A central goal of workers' compensation programs is to replace a portion of preinjury earnings for workers who are injured or made ill by their work. This model therefore requires that we look at the actual earnings losses of the individual worker that are attributable to work disability. To foster ease of administration, there are frequently "rules of thumb" that constitute rough approximations to these pure principles. But the specific controlling factors that determine both benefit rates and benefit adequacy vary according to the worker's prior and predicted future economic status.

The adequacy of benefits is therefore measured by the extent to which the benefits paid replace the worker's actual losses attributable to work disability. A pure application of this model would include all temporary earnings losses while healing (including both wages and benefits), as well as replacement of lifetime earnings losses, which includes earnings, fringe benefits, and retirement benefit losses.

As actually applied in workers' compensation programs, this model produces results that can be perceived as both fair and unfair. It is fair because workers theoretically receive compensation proportional to actual losses associated with work disability. Despite possible equivalency of impairment, length of disability, or noneconomic losses, those who earned more prior to the injury would receive higher benefits; those who earned less would receive lower benefits. From a different perspective, this model may be unfair because it perpetuates economic inequalities. Workers who earned little before an injury would receive low benefits, irrespective of level of impairment, economic need, or extent of noneconomic losses.

This model also can produce significant inequalities between those with partial and total disabilities. For example, a worker with a total disability would receive the two-thirds statutory replacement rate for all 100 percent of his lost wages, while a worker who lost 50 percent of his wages would receive the statutory replacement rate on the 50 percent of wages lost and would earn 100 percent of the wages not lost. When the total incomes in terms of benefits and wages are compared, the injured

worker with the partial disability has a larger income even though benefits replaced the same percentage of lost wages. Moreover, this model focuses only on economic losses. Thus, workers with severe impairments who nevertheless succeed in the labor market would receive low benefits. But these workers may still have significant loss of quality of life, loss of earnings, or other noneconomic losses. In other words, potentially large noneconomic losses are ignored by a strict wage loss model.

### **The Social Adequacy Model**

Social adequacy measures the extent to which benefits provide a “socially adequate” standard of living. It focuses on prevention of poverty rather than replacement of lost wages.<sup>4</sup> Unlike the loss of earnings model, social adequacy presumes that the purpose of benefits is to provide a minimum level of support. In preventing poverty, the focus is on whether benefits meet an externally defined minimum. While the loss of earnings model uses the actual wage loss as a ceiling for assessing benefit adequacy, social adequacy focuses on the sufficiency of the floor. The floor is based upon factors that are external to the particular employer–employee relationship, the economics of that relationship, or the wage-earning capabilities of the individual injured worker. Thus, in sharp contrast to the loss of earnings model, the assessment of benefit adequacy would not be tied to the individual worker’s prior wage level or presumed loss of future earnings.

Typically, social welfare or assistance programs are measured by this standard. In contrast, social insurance programs usually focus on retention of prior economic position of the individual worker through replacement of earnings. As a result, benefits in social insurance programs generally tend to be higher overall, and higher benefits (in absolute terms) are usually paid to beneficiaries who had higher earnings in the past.

However, it is important to also measure social insurance benefits against reasonable external benchmarks that define the adequacy of the floor in order to assess whether these benefits function to prevent poverty or accomplish other social objectives. In designing the theoretical social adequacy model, various “floors” could be utilized, e.g., the federal poverty level, the income generated by full-time work at the

minimum wage, a “living wage,” or perhaps the amount provided by a Temporary Assistance for Needy Families (TANF) grant.

The social adequacy model reverses many of the perceived elements of the work disability model. Under this model, workers receive benefits based on economic need, as measured by an external standard. Thus, workers who have been able to achieve higher standards of living due to higher preinjury wages will likely experience greater losses in their standards of living under such a model.

## **TREATMENT OF LOSSES IN WORKERS’ COMPENSATION PROGRAMS**

### **The Purposes of Workers’ Compensation**

Workers’ compensation programs provide benefits to workers whose disabling injuries or illnesses are caused by work. In general, benefits are provided only for the consequences of illnesses and injuries that “arise out of and in the course of” employment. A primary goal of workers’ compensation programs is to replace a portion of the earnings by workers who are injured or made ill by their work while maintaining the incentive to return to work.

Another major goal is to provide appropriate and sufficient treatment to promote an optimal recovery and return to work, thus minimizing the need for wage replacement payments in the future. However, the focus of this study is strictly on the adequacy of cash benefits paid as wage replacement to injured workers. The adequacy of medical treatment and rehabilitative care is a separate area of study that is beyond our purview.

Thus, when people talk about the adequacy of cash benefits<sup>5</sup> in the workers’ compensation context, they generally are referring to the extent to which benefits replace lost earnings. Further, wage losses as measured in workers’ compensation programs usually do not include nonwage (or fringe) benefits. For a number of reasons, including historical precedent, administrative simplicity, and the perceived impact on return to work incentives, workers’ compensation programs generally ignore nonwage compensation, nonwork losses, and noneconomic losses, although there are a few exceptions. The total losses borne by the in-

jured worker and his or her family (or other social programs) can therefore be considerable, even if wage replacement adequacy is achieved.

### **Key Differences between Workers' Compensation and Other Social Programs**

From the standpoint of a discussion of benefit adequacy, there are five key differences between workers' compensation programs and other social programs in the United States.<sup>6</sup> First, unlike federal disability income programs, workers' compensation programs provide benefits for both short-term and partial disability (and therefore partial loss of earnings). Federal disability income programs (Disability Insurance and Supplemental Security Income) require full and long-term disability before providing benefits. Our analysis of benefit adequacy focuses on earnings losses from work disability, even if the individual continues to work.

Second, workers' compensation programs are exclusively under the control of states, with no federal role or involvement.<sup>7</sup> The state systems differ somewhat with regard to benefit levels, more widely in eligibility standards, and considerably in procedural rules and administration.<sup>8</sup> This means that any cross-jurisdictional study of benefit adequacy requires acceptance of the unique features of the different state systems and awareness of their impact.

Third, under no-fault workers' compensation programs, injured workers receive certain benefits and are thereby precluded from seeking damages from their employers, even if their injuries were negligently or recklessly caused by the employer (exclusive remedy principle). Thus, workers as a group gave up the right to sue their employers in the political compromise that led to the adoption of workers' compensation programs early in the twentieth century.<sup>9</sup>

Fourth, other social programs seek to achieve a different balance between loss replacement and social adequacy than workers' compensation. Many social insurance systems balance social adequacy against earnings losses by setting benefits in relation to wages, but also creating a minimum benefit rate and/or designing benefits to provide a higher replacement rate for lower-wage workers. As a result, benefit adequacy discussions in needs-based social welfare programs usually focus on social adequacy. This is in marked contrast to workers' compensation programs, which generally focus on wage replacement adequacy,

return-to-work incentives, and affordability for employers. Nevertheless, as we shall see in the next section, workers' compensation benefits do have some characteristics that are generally associated with social welfare systems.

Last, with a few exceptions, workers' compensation differs from most other social insurance systems in that it is funded entirely by employers. Thus, employers have an influence on program design and administration that reflects their status as stakeholders in the program.

### **Earnings Replacement in Workers' Compensation**

Although workers' compensation programs are built on a model of replacement of wage losses, these programs usually do not fully replace lost wages. Concerns about costs, beneficiary incentives, social adequacy, and other factors have all influenced the design of the benefit structure. Most typically, workers' compensation programs have paid a wage replacement benefit for total disability set at two-thirds of the gross wage,<sup>10</sup> which we take as the basis for our standard of benefit adequacy.

Our choice of an adequacy standard that requires benefits to replace two-thirds of lost wages is supported by the evolution of the provision in the Workmen's Compensation and Rehabilitation Law, commonly referred to as the Model Act, which was issued in two versions by the Council of State Governments. The original Model Act (Council of State Governments 1965)<sup>11</sup> provided in cases of total disability that cash benefits were 55 percent of the worker's preinjury wage, plus an additional 2.5 percent for each dependent, up to a maximum of five dependents (or 67.5 percent of preinjury wage). For partial disability, the Model Act provided that cash benefits were 55 percent of the worker's loss of earning capacity, plus an additional 2.5 percent for each dependent, up to a maximum of five dependents. The original Model Act also provided that scheduled income benefits should be paid at a weekly rate of 55 percent of the worker's preinjury wage for durations determined by the extent of impairment as measured by the American Medical Association's evaluation procedure.<sup>12</sup> The original Model Act also provided that all types of cash benefits were subject to a maximum weekly benefit that was two-thirds of the state's average weekly wage.

The National Commission on State Workmen's Compensation Laws referred favorably to the Model Act at several places in its 1972

Report.<sup>13</sup> However, the National Commission changed the recommended replacement rate for total disability so that benefits should replace at least two-thirds of the worker's preinjury wage.<sup>14</sup> The commission also recommended that a worker's benefits for total disability be subject to a maximum weekly benefit of at least 200 percent of the state's average weekly wage. The commission was unable to reach an agreement on recommendations for permanent partial disability, other than recommending that each state and the federal government examine these benefits.

Subsequent to the completion of *The Report of the National Commission on State Workmen's Compensation Laws* in 1972, the Council of State Governments appointed a new Advisory Committee on Workmen's Compensation Laws, which was asked to review the original Model Act and to incorporate changes to fully meet all 74 recommendations of the National Commission. The resulting product, the Workmen's Compensation and Rehabilitation Act (Revised) (Council of State Governments 1974), which we will refer to as the Model Act (Revised), serves as the basis for the analysis of social adequacy of benefits used here.<sup>15</sup>

The Model Act (Revised) provides for total disability that cash benefits are two-thirds of the worker's preinjury wages and for partial disability that cash benefits are two-thirds of the decrease in wage-earning capacity. The Model Act (Revised) also provides that scheduled benefits should be 55 percent of the worker's preinjury wage for the durations determined by the extent of impairment as measured by the American Medical Association's *Guides to the Evaluation of Permanent Impairment* (1971).

The Model Act (Revised) (1974, p. 20) states that "The Report of the National Commission on State Workmen's Compensation Laws did not make a recommendation with respect to the 55 percent figure in this subsection and, therefore, this Committee made no change in the suggested language. However, a State may wish to raise this figure to two-thirds so as to be consistent with subsections (a) [pertaining to total disability] and (b) [pertaining to partial disability]." The Model Act (Revised) also provides that all types of cash benefits should be subject to a maximum weekly benefit that (since 1981) is 200 percent of the state's average weekly wage.

The essence of this evolution of the Model Act published by the Council of State Governments is that the latest version recommends

that cash benefits be two-thirds of earnings losses for total disability and for partial disability based on loss of earning capacity. For scheduled PPD benefits, the Model Act (Revised) maintains weekly benefits as 55 percent of preinjury wages, although states are given the option of adopting two-thirds of preinjury wages for scheduled benefits to be consistent with the other types of cash benefits. Accordingly, we will use the 55 percent replacement rate for scheduled benefits as the basis for our comparisons in Chapter 4 between state statutory provisions and the benefits prescribed by the Model Act (Revised). Our evaluations in Chapter 6 of the adequacy of actual workers' compensation cash benefits will rely on the standard that benefits should replace two-thirds of lost wages, in part because that is the general approach used in the Model Act (Revised). We also recognize that the Model Act (Revised) provides some basis for an argument that a replacement rate lower than two-thirds of lost wages may be appropriate for workers receiving permanent partial disability benefits.<sup>16</sup>

Temporary total disability (TTD) benefits in workers' compensation programs most clearly illustrate the strategy for replacing wage losses.<sup>17</sup> TTD benefits seek to replace wages that are lost because a worker cannot perform his or her regular job for a temporary period of time. However, because of the tension between the wage replacement goal and concerns about employer costs, return-to-work incentives, and other goals, TTD benefits do not completely replace earnings losses. First, only two-thirds of preinjury wages are typically replaced. This is thought to preserve worker motivation to return to work.

In addition, wage replacement benefits do not begin until after a waiting period, ranging from three days to seven days among the states. This could be thought of as an implicit "deductible" provision for injured workers, although it is usually retroactively reimbursed if disability continues beyond a certain number of days. Third, weekly benefits are always limited by an externally determined maximum benefit, most often connected to the state's average earnings level. Nearly half of the states set this maximum benefit rate at 100 percent of the state's average weekly wage. The result is that higher-paid workers receive a lower percentage replacement of gross wage losses than lower-wage workers. In addition, most jurisdictions specify a minimum benefit, presumably reflecting some political judgment about the minimum required for social adequacy. As a result, low-wage workers may receive

a higher replacement rate than higher-wage workers, even extending beyond full wage replacement for low-wage workers in some jurisdictions.

Last, in a few states the duration of workers' compensation TTD benefits is capped at an arbitrary period of time, ranging from 104 weeks to 500 weeks (from 2 to almost 10 years). Although a disability lasting several years is not commonly thought of as "temporary," this limit means for a few workers benefits may end before the worker has reached maximum medical improvement or before he has returned to work. Obviously, this would reduce the adequacy of wage replacement for that worker. On the other hand, scheduled benefits that pay a fixed number of weeks regardless of work status may exceed adequate compensation. Both provisions place ease of administration over adequacy considerations in policy design.

Also, using two-thirds of gross earnings to approximate post-tax income does not take individual differences in tax status into account. The more recent trend in workers' compensation programs of using spendable earnings as the benefit base addresses this problem but does not resolve it completely. Again, program administrative feasibility may cause compromises in adequacy or equity. The net result of these program attributes is that benefits may be less than actual wage losses (e.g., for high-wage workers) or more than wage losses (e.g., for workers in low tax brackets), depending on the circumstances of the particular worker and the workers' compensation program parameters. Nor does a two-thirds of gross wage benefit consider savings to workers from reduced employment expenses such as commuting, food, and child care, or the possible receipt of benefits from other payment systems.

PPD benefits vary much more widely than TTD benefits (see Barth and Niss 1999). In theory, these benefits are designed to replace the future loss of earning capacity caused by the permanent effects of a compensable injury, after a worker has reached maximum medical improvement (MMI). However, PPD benefits often do not accurately replace actual long-term wage losses.

Partial or inaccurate wage replacement is due to a multitude of program design factors. As indicated earlier, administrative simplicity may have trumped other considerations. Most determinations of future earnings losses are made on a one-time basis. Workers' compensation is a

system that handles a very large number of claims, and perfect justice is probably unattainable in a system that operates in an area of subjective judgments and strong feelings. In addition, maximum benefits may prevent full recovery or the numbers of weeks of benefits may be capped. Each of these would reduce overall adequacy but reflect the intention of policymakers to preserve return-to-work incentives.

Moreover, an increasing number of states have converted to impairment-based assessments, usually from loss of earning capacity systems. These impairment-based systems do not attempt to directly determine the specific impact of the injury or resulting impairment on earnings, but look instead at the level of physiological or functional impairment that is caused by the injury. The compensation amounts are then set based upon a predetermined scale of benefits. According to Barth and Niss (1999), 19 states use the “impairment” standard, and 9 others use it in some circumstances.<sup>18</sup> Most use worker wage information in calculating the benefit payment. Unfortunately, there are no studies that compare the adequacy of benefits for similar cases across the different types of designs presently in use for compensating PPD.

Permanent total disability (PTD) benefits are provided to individuals who cannot work at all, or who are presumed to be unable to work, as a result of a work-related injury or illness. These benefits are usually not adjusted for inflation or projected wage increases. In view of the longer-term and more serious nature of the worker’s disability in PTD cases, the failure to make these adjustments over the life of the claim likely results in lower wage replacement rates. Some states also terminate PTD benefits after a statutory number of weeks. Moreover, compromise and release settlement of disputed permanent disability claims may result in the termination of these benefits with a lump-sum payment that may or may not accurately reflect future developments in the case. Moreover, if a worker’s claim is litigated, in most states the worker bears the cost of obtaining the recovery, which reduces his or her net benefit.

### **Social Adequacy in Workers’ Compensation**

Because the goal of workers’ compensation programs is to replace lost earnings, benefits in workers’ compensation programs are not specifically designed to meet a social adequacy standard. Nevertheless,

despite the dominance of the wage replacement model, workers' compensation programs do not completely ignore the issue of social adequacy. For example, a higher relative wage replacement benefit may be paid to lower-wage workers as a result of the maximum cap on weekly benefits for highly paid workers. A few states also provide increases in benefits based on the claimant's number of dependents, a factor unrelated to actual losses but presumably related to social adequacy goals.

Some states set a minimum benefit level tied to a percentage of the state average weekly wage. While not linked to any specific measurement of poverty, the only plausible explanation for these minimum benefit levels is that there is a desire to set a social minimum, as well as replacing preinjury earnings. These minimum benefits can actually generate weekly benefits that exceed the weekly earnings losses (because the worker was employed part time or at a very low-wage level, or because the worker was injured long ago and therefore his or her past wages do not reflect current norms, or because of some other eccentricity of the particular system). Such anomalies are more easily understood if one accepts that social adequacy, although not the primary workers' compensation objective, is nevertheless one reasonable goal for a social insurance program.

In 1972, the National Commission on State Workmen's Compensation Laws (1972, p. 53) found that benefits in most states were "not adequate." Not only did benefits inadequately replace lost earnings, but in many states they did not even meet minimal social adequacy standards. Even for higher-wage workers, ". . . the *maximum* weekly benefit for temporary total benefits in more than half of the States did not reach this poverty level" (p. 61).

## CONCLUSION

So there are a number of reasons why workers' compensation benefits likely do not replace the full wage losses of injured workers. The question for this book is how close they come to meeting our two-thirds wage replacement standard. Of course, a broader recognition of losses would also encompass the value of the worker's full compensation package, including the value of lost nonwage benefits, costs incurred as

a result of loss of these benefits (e.g., uninsured health expenses of the worker and his or her dependents), losses associated with the fact that the worker may forfeit future wage increases, losses of future income as a result of current loss of wages and pension benefits, and so on. But the workers' compensation programs do not include these losses, and we do not consider them in our assessment of wage replacement benefit adequacy.

When workers' compensation programs were designed in the early twentieth century, their focus was clearly on wage losses. Partial replacement of preinjury wages and medical treatment in a no-fault insurance system was exchanged for the possibility of tort relief from employers. The use of wage loss, without consideration of other losses, may no longer be the most accurate measure of economic losses emanating from a work-related injury or illness. Adequacy measures that are tied solely to wage loss fail to measure all of the other losses that injured workers may experience. On the other hand, the failure to consider the impact of income and payroll taxes and the value of personal leisure also means that we are underestimating the value of the wage replacement benefit. Nevertheless, the following chapters will reveal that we have no realistic alternative measure; thus, we will proceed with estimates of benefit adequacy based on lost wages alone. However, because we are aware of a broader standard of benefit adequacy, we will refer to the measures developed in this volume as measures of "wage replacement adequacy" or "earnings replacement adequacy."

Our analysis in this book employs the wage replacement standard to empirically assess benefit adequacy in workers' compensation programs. This will be done at the individual worker level, for all workers as a class, and by measuring benefit adequacy against a broad social standard. The next chapter considers issues that arise when one actually attempts to measure wage replacement adequacy.

## Notes

1. We include these here as a separate category of losses. Workers' compensation was designed to provide medical treatment for occupational injuries. Because the subject of medical care in workers' compensation is a separate area of study (and controversy), we do not attempt to address in this chapter issues associated with provision of these services, or replacement of these losses.

2. This is sometimes described as work disability, but work disability must be distinguished from disability caused by work. Disability caused by work focuses on the question of the cause or etiology of the disability. "Work disability" is the decreased ability of an individual to compete in the labor market as a consequence of an injury or illness. Work disability can be both temporary (during the period of healing and recuperation) and permanent. Permanent work disability can result directly from the physical or mental impairments that stem from the injury. Work disability is also commonly viewed as encompassing losses that result from discrimination or exclusion that may be a consequence of the injury or impairment. This can be confusing in discussions of workers' compensation, which provides benefits to replace losses related to work disability if the disability is caused by ("arising out of" and "in the course of") employment. For a broader discussion of work disability, see Nagi (1991).
3. Notably, the U.S. Supreme Court held that state workers' compensation laws cannot require that employers continue health insurance for a worker and his or her family while the worker is eligible for workers' compensation benefits (*District of Columbia v. Greater Washington Board of Trade*, 506 US 125 [1992]; enjoining enforcement of District of Columbia Workers' Compensation Equity Amendment Act section which required employers who provide health insurance for their employees to provide equivalent health insurance coverage for injured employees eligible for workers' compensation benefits).
4. For an exploration of social adequacy as a measure of social insurance adequacy, see Graetz and Mashaw (1999).
5. We use *cash benefits* as a synonym for *indemnity benefits*, as that term is used in workers' compensation. These terms include all benefits that are paid directly to workers and exclude those payments made to providers of services (including medical, psychological, and rehabilitative). We make the assumption that all cash benefits paid to workers are intended to replace lost earnings.
6. There are, of course, many other differences. As noted earlier, benefits are only paid if the injury or illness is work related. Moreover, these state systems are designed in a manner that differs in both financing and administration from other social programs.
7. There are a number of federal laws with specific and limited coverage, including the Federal Employees' Compensation Act, the Longshore and Harbor Workers Act, the Black Lung Act, and the Energy Employees Occupational Illness Compensation Act. In a sense, these are federal workers' compensation laws for federal employees or for other specific workers.
8. Some procedural rules can have significant impact on benefit adequacy. Most particularly, the allowance of *compromise and release* agreements (also known as *lump-sum* agreements or *washouts*) enables program beneficiaries to negotiate a one-time payment for cash and medical benefits in a claim. This practice can change the actual amount of money received and the availability of the cash over the period of need. See Barth and Niss (1999) for an examination of the ways in which workers' compensation programs compensate permanent partial disabilities.

## 38 Alternative Meanings of Benefit Adequacy

9. See Williams and Barth (1973, Chapter 2) for a brief account of the historical development of workers' compensation.
10. There are now, however, six jurisdictions that use the spendable earnings approach, and eight others that use a gross wage replacement rate other than two-thirds.
11. The original Model Act was drafted by an Advisory Committee on Workmen's Compensation, which consisted of 21 members who represented important constituencies of the program. In addition to Arthur Larson, a Duke University professor who chaired the committee, members included representatives from employers and employer associations, unions, state workers' compensation agencies, other government agencies, universities, insurance carriers and associations, and the American Medical Association.
12. The first edition of the *Guides to the Evaluation of Permanent Impairment* was not published by the American Medical Association until 1971. However, a series of 13 articles with ratings of permanent impairment for various body systems was published in the *Journal of the American Medical Association* between 1958 and 1970, and the drafters of the original Model Act relied on these articles.
13. For example, the National Commission report (NCSWCL 1972, p. 44) referred to the Model Act and the recommended standards published by the U.S. Department of Labor as "standards which reflect earlier deliberations and which are widely accepted as desirable."
14. NCSWCL recommended that total disability benefits should be at least 80 percent of the worker's spendable weekly earnings, which were defined as the worker's gross weekly wages minus the worker's deductions for federal income taxes and the Social Security program. As explained in the *Compendium on Workmen's Compensation*, published by NCSWCL (Williams and Barth 1973, p. 132):

This system makes benefits 80 percent of spendable earnings. The 80 percent figure was chosen because for an average size family (four persons) earning the U.S. average wage (estimated to be \$150 per week in 1972), the benefit would be \$105.53. In contrast, a benefit of  $66\frac{2}{3}$  percent of the gross weekly wage would be \$100. The commission felt the extra \$5.53 was an appropriate adjustment reflecting the increasing importance of supplements since the  $66\frac{2}{3}$  percent allowance was first developed. Since supplements (such as employer contributions for pensions plans) are not included in the gross or spendable average weekly earnings figures, an adjustment to compensate for their omission is appropriate.

This explanation makes clear that the commission intended for benefits to be at least two-thirds of lost wages, since the 80 percent of spendable earnings approach would have provided even higher benefits.

15. The Model Act (Revised) was prepared by an Advisory Committee on Workmen's Compensation, which consisted of 16 members, who represented important constituencies of the program. In addition to Indiana State Senator Wilfrid J. Ullrich, who chaired the committee, members included Andrew Kalmykow and John F. Burton, Jr., who had served on the NCSWCL.

16. Use of the Model Act (Revised) will not produce a 55 percent replacement rate for all PPD cases. For example, the Act provides that partial disability that results in loss of earning capacity should provide benefits that are  $66\frac{2}{3}$  percent of the loss of that capacity. Many states base nonscheduled PPD benefits on the loss of earning capacity approach. Also, even when the PPD benefits are based on a scheduled duration with weekly benefits that are 55 percent of preinjury wages, most such cases will also involve temporary total or temporary partial disability benefits for which the Model Act (Revised) indicated that benefits should be  $66\frac{2}{3}$  percent of lost wages. Thus, the Model Act (Revised) will result on average in replacement rates for PPD benefits that exceed 55 percent of preinjury wages even if the scheduled PPD benefits are based on that replacement rate.
17. The different categories of benefits in workers' compensation are described in Chapter 1. See U.S. Department of Labor (2002) for a description of benefits (and other provisions) in the different states.
18. However, there are wage loss components built in because the ultimate award is tied to the weekly benefit rate which is based (within limits) on the worker's weekly wage. Therefore, these benefits are not wholly independent of wage replacement.



## 3

# Measuring Benefit Adequacy

Chapter 2 discussed several theoretical approaches to assessing the adequacy of workers' compensation benefits; in this chapter, we describe the principles and pitfalls of measuring benefit adequacy empirically. We focus on the traditional measure of workers' compensation benefit adequacy, the replacement of injured workers' lost wages. This is the most widely used measure, and it certainly provides critical information. However, we acknowledge that it ignores several important categories of losses discussed in Chapter 2, including nonwork losses and noneconomic losses. For this reason, we will use the term *wage replacement adequacy* to represent this less global concept. It is not the perfect measure of benefit adequacy, but it has the great advantage of being feasible with current methods and data.

This chapter begins with an operational definition of wage replacement adequacy and describes some conceptual and methodological issues involved in measuring losses. We then describe the kind of data that would be ideal for estimating lost earnings and the practical problems involved in actually measuring replacement of lost earnings. These problems are both inherent in the task and derive from limitations in the data that are available to measure replacement. We then turn to some important issues in measuring and comparing injury-related losses. Finally, we preview the empirical approaches to benefit adequacy described in Chapters 4 and 5.

The chapter also includes two technical appendices. Appendix 3A provides a discussion of some of the methodological issues that must be settled before an empirical measure of adequacy can be derived. Appendix 3B presents the mathematical and statistical details involved in estimating wage losses and wage replacement adequacy.

### **OPERATIONAL DEFINITION OF REPLACEMENT ADEQUACY**

In a policy sense, benefit adequacy is measured by the relationship between actual and target replacement rates, where the replacement

rate is the ratio of benefits received to injury-related losses. If a worker is injured, loses \$1,000 in wages, and receives wage replacement benefits of \$800, she has an 80 percent replacement rate. If the workers' compensation statute specifies a target replacement rate of 100 percent, her wage replacement at 80 percent is inadequate; if the statutory target rate is 60 percent, her wage replacement is more than adequate.

To measure wage replacement rates, we need to measure benefits paid and injury-related wage losses incurred. Although we have specified that we will confine our attention to the replacement of the injured worker's lost earnings, any attempt to measure replacement adequacy still needs to nail down a specific definition for both benefits and losses, answering a number of questions.

- 1) Do benefits include just workers' compensation benefits, or do they include payments from other social or private insurance systems? Including other benefits provides a better measure of the overall adequacy of private and social insurance for injured workers, but a worse measure of the adequacy of workers' compensation benefits. We choose to focus on the adequacy of workers' compensation benefits alone, recognizing that we will be underestimating the benefit adequacy for workers who have multiple benefit sources.
- 2) Do they include all benefits paid, or just benefits received, excluding the costs of obtaining those benefits, like attorney fees or medical and legal costs? We choose benefits received, a better measure of adequacy to the injured worker, although we are not always able to achieve this empirically. Sometimes administrative data do not differentiate the costs of securing benefits.
- 3) Do losses include lost employee benefits, like employer contributions to health insurance and retirement programs?<sup>1</sup> Inclusion of employee benefits would take into account the fact that employee benefits currently average about 38 percent of wages and salaries for all civilian workers in the private sector (U.S. Bureau of Labor Statistics 2002). However, we lack sufficient information about changes in benefits for workers whose employment status, jobs, or hours change as a consequence of injury. In some cases, no benefits will be lost; in others, the value of lost benefits might be greater than earnings. Omitting benefits from estimated earnings losses means that we are overestimating true replacement rates.

- 4) Are losses measured before taxes or after taxes? This is important because workers' compensation benefits are exempt from federal and state income taxes and payroll taxes. However, after-tax earnings are obviously significantly lower than pretax earnings. This is the reason that a handful of states and most Canadian provinces have converted to a benefit based on "spendable earnings," or after-tax income. Federal income tax rates vary by income, family status, allowable deductions, and other factors. For many injured workers, more than 25 percent of lost earnings would have been paid in taxes.<sup>2</sup> This would mean that replacing 75 percent of pretax losses would be equivalent to replacing 100 percent of after-tax losses.

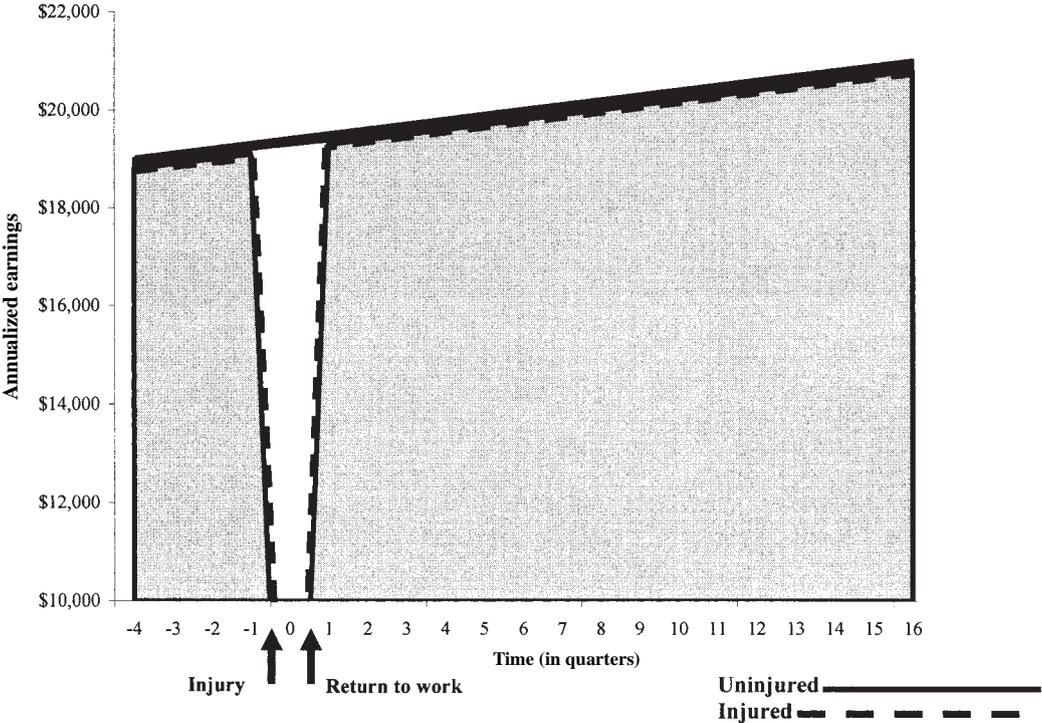
Ideally, we would like to compare lost spendable earnings with workers' compensation wage replacement benefits. This would mean comparing after-tax earnings with benefits. However, as with other employment benefits, we lack specific information on taxes paid by injured workers, which vary by, among other things, marital status, number of dependents, and the earnings of other family members. We generally do not compare after-tax losses with benefits for this reason, although it is possible to impute tax rates to individuals, and this has been done in some studies. Of course, the bias from using pretax losses is in the opposite direction from the bias from not counting lost fringe benefits.<sup>3</sup>

In summary, our approach is to focus on workers' compensation wage replacement benefits received, comparing them with pretax lost earnings, exclusive of nonwage compensation. Each of these choices affects the magnitude of the estimated replacement rate and may also have affected the legislative choice of a target replacement rate. However, we take our guidance from the majority of states, which declare that in cases of temporary total disability, two-thirds of gross pretax lost wages should be replaced, subject to maximum and minimum benefit levels. For the purposes of this analysis we use a replacement rate of two-thirds of gross wages as the standard of benefit adequacy.

### **Measuring Losses: Conceptual Issues**

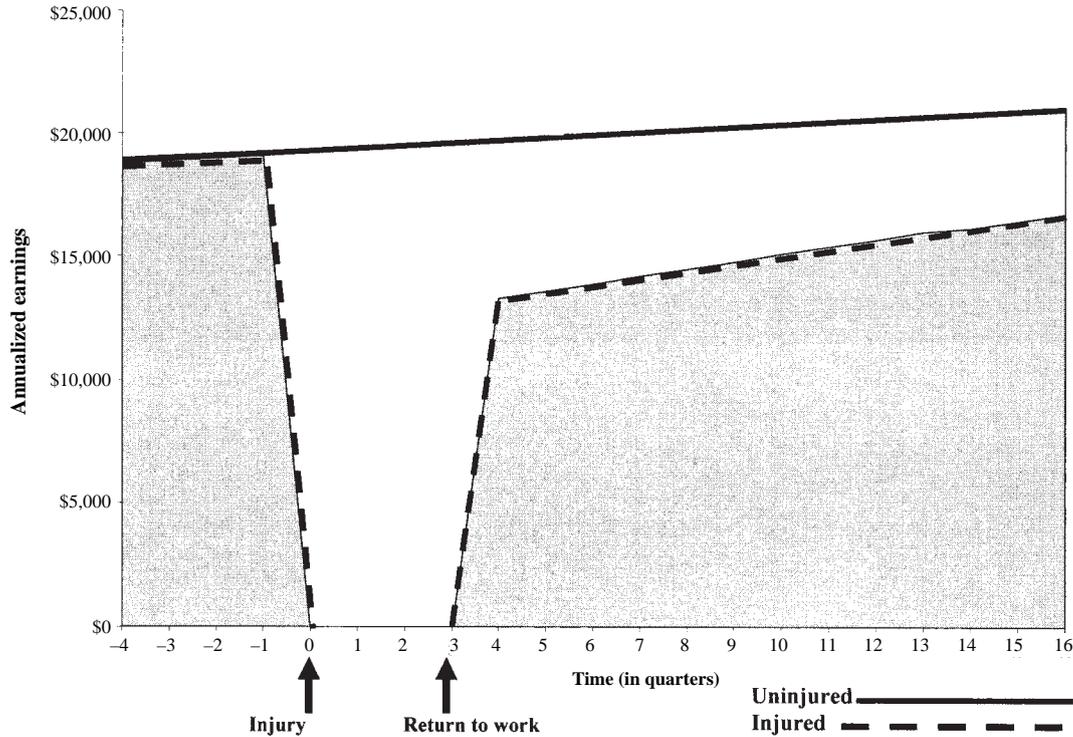
To measure wage replacement, we need to determine the amount of injury-related losses and compare the losses to workers' compensation benefits received. Although there are some practical difficulties in

Figure 3.1 A Conceptual Model of Temporary Injury-Related Losses



SOURCE: Adapted from Reville (1999).

**Figure 3.2 A Conceptual Model of Permanent Injury-Related Losses**



SOURCE: Adapted from Reville (1999).

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 wage losses. Before the injury occurs, the worker's earnings are observed, and Figure 3.1 shows them at about \$20,000 annually and increasing slowly through time. After the injury, the worker recovers at home or in the hospital. Earnings disappear until the worker begins work again. At that point, wages may return to the uninjured earnings path (indicated by the dashed line). However, upon return to work, some people work fewer hours or at a lower rate of pay than before the injury. Eventually, most recover to the preinjury earnings path, but some never do. This permanent loss of earnings reflects permanent disability. For the permanently disabled worker in Figure 3.2, injured earnings never reach the level of uninjured earnings. Thus, total losses include both the wages lost during the period of temporary total disability and the permanent losses that will accumulate in the future.<sup>4</sup> Of course, for any specific individual, there is no assurance that wages would necessarily have continued on the projected path had the injury not occurred.

If we could draw a figure like Figures 3.1 and 3.2 for each injured worker, we could calculate lost earnings as the difference between the dashed line—uninjured earnings—and the solid line, which is the shaded area in Figures 3.1 and 3.2. This is impossible, however, since we cannot observe uninjured earnings. They do not exist in the real world, where each person is either uninjured or injured. We can't turn time back, prevent the injury, and then observe the earnings of the same individual in the uninjured state. This creates the challenge of finding an effective way to estimate uninjured earnings.

### **Measuring Benefits: Conceptual Issues**

While not as challenging as measuring lost wages, workers' compensation benefit measurements present some unique problems as well. First, wage replacement benefits are subject to waiting periods of from three to seven days in U.S. jurisdictions.<sup>5</sup> This means that the worker absorbs the income losses for the first few days, unless the employer voluntarily makes up the difference.

This “deductible” feature serves two purposes in the workers’ compensation programs. First, it constitutes an implicit cost sharing for income maintenance with the worker that reduces the likelihood of claims for minor injuries. Second, it reduces the number of claims with income replacement payments and thus the administrative burden on the system. In fact, about 75 percent of all workers’ compensation claims do not involve any indemnity payments at all, and these “medical only” claims impose very little burden on workers’ compensation agencies.

In addition, wage replacement benefits are generally subject to a retroactive period. Typically, this means that if the injured worker is out of work for more than a certain period of time, usually 14 to 21 days, then she collects income maintenance payments for the waiting period as well. The premise behind such provisions is that workers who are more seriously injured (according to length of time away from work) should not have to absorb the implicit cost sharing of the waiting period.

Another common practice in some workers’ compensation programs causes difficult problems in assessing benefit adequacy. In many states, workers and employers/insurers are allowed to settle workers’ compensation claims that involve disputes between the two parties. Called *settlements*, *compromise and release agreements*, *redemptions*, or *washouts* in various jurisdictions, these claims present serious difficulties in assessing benefit adequacy, even by the wage replacement standard.

One issue is that the lump-sum payments that generally accompany such settlements may constitute a mixture of different kinds of benefit payments, frequently not neatly enumerated as to their purpose. Thus, a lump-sum payment might encompass future medical costs, special rehabilitation costs, and wage replacement costs. Since the settlement is negotiated, there may be no way of determining exactly what is being compensated. Each side may have its own interpretation of the payment, and the lump sum is just a monetized representation of the losses that are being compensated, much as in the personal injury model discussed in Chapter 2.

In addition, a claimant with attorney representation generally must pay the fees and other costs of the litigation out of the lump-sum or periodic payments. The likelihood of attorney involvement is greater in

states where compensability tests are unclear or the mechanism for measuring permanent partial disability is more subjective. This book does not take into account the worker's net recovery after payment of these costs.

Another crucial difficulty comes in determining the time period for which the lump-sum settlement is compensating. One extreme would be to spread the wage replacement benefits over the rest of the injured worker's life, on the grounds that this particular injury will never again be compensated (that is, the *release* part of the compromise and release agreement). Another extreme would be to assign the wage replacement benefit to the year in which it is paid or perhaps the next few years. The former will probably result in underestimating the adequacy of benefits paid in the period following the injury, while the latter will likely overestimate the adequacy of these benefits.

Finally, some settlements occur because of a dispute over whether the injury is covered at all by workers' compensation, or whether it is a given employer's responsibility. In that case, the settlement may look low because the parties have compromised on an amount between full payment of benefits and zero benefits (the amount due if the injury is not compensable). For claims with disputes over compensability, it is difficult to interpret the replacement rate, although the calculated replacement rate will likely underestimate the actual replacement of covered losses.

## ALTERNATIVES FOR CALCULATING LOST EARNINGS

### Preinjury Earnings

One estimate of uninjured earnings is average earnings in the preinjury period; in fact, this is typically how workers' compensation benefits are determined. To calculate temporary disability benefits, workers' compensation systems typically use preinjury wages to estimate the wages that would have been earned had an injury not occurred. Then they assess losses as the difference between current wages and preinjury wages. This approach produces reasonable loss estimates for short-term injuries, where workers fully recover and return to work in a matter of days or weeks.<sup>6</sup> It is much more problematic for injuries with long-term

impacts. This is because the future earnings of uninjured workers will typically differ from their current earnings. For example, young people, just out of school, can expect their earnings to rise substantially over the first decade in the labor market. On the other hand, the earnings of most people in their early sixties will fall over the ensuing decade.

### **Age-Earnings Profiles**

These observations have led some researchers to use age-earnings profiles to project uninjured earnings over the years following injury. Age-earnings profiles show how average earnings in a group vary with age. They can be constructed for the working-age population as a whole or for subgroups of workers, categorized by relevant characteristics like gender, race, and education. Figures 3.3a and 3.3b display estimated age-earnings profiles for women and men from ages 22 to 62.

Both figures could be used to project earnings of specific workers by scaling their observed preinjury earnings according to the growth rates implied in the profile. Variations on this method might develop different growth rates depending on personal or employer characteristics. An important study using this approach was done by Berkowitz and Burton (1987), who projected future earnings depending on the injured worker's age, gender, and preinjury earnings. An earlier study by Johnson, Cullinan, and Curington (1978) adjusted preinjury earnings for inflation and average productivity changes in the private sector of the economy as a way to keep the wage losses more contemporary.

### **Matching and Regression**

Many events may increase or reduce earnings, including promotions, pay raises, spells of unemployment or ill health, retirement decisions, cyclical changes in economic conditions, and long-run labor market trends. Although we cannot predict for a specific individual which of these events will occur or when they will occur, statisticians have developed techniques to measure average changes in earnings for groups of people with similar personal and employer characteristics.

Suppose that a researcher can identify a group of workers who all have characteristics that should produce, on average, the same earnings profile over time. If some of them are injured and some are not, then the uninjured group can be used to identify the dashed line in Figure 3.1 or

Figure 3.3a Age-Earnings Profile of U.S. Women

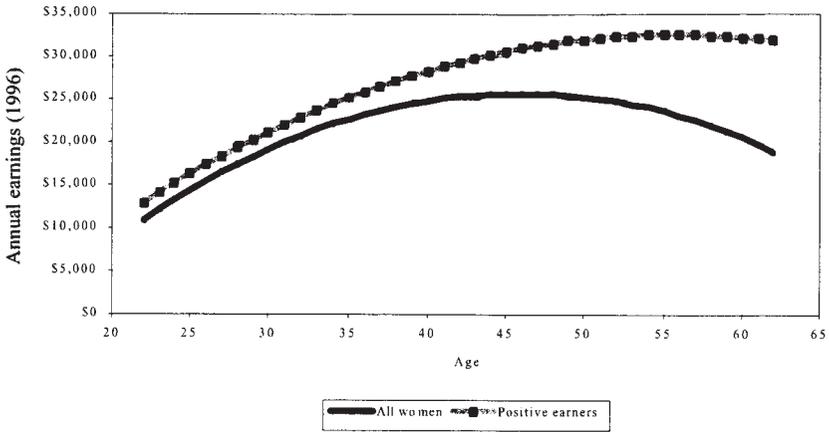
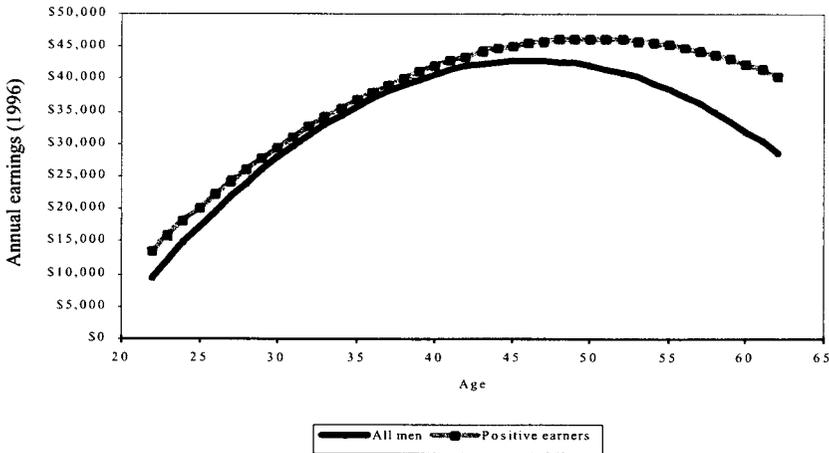


Figure 3.3b Age-Earnings Profile of U.S. Men



SOURCE: Burtless (1999).

3.2, representing the hypothetical earnings of the injured worker if he had not been injured. The success of this approach depends on how closely the injured and uninjured workers are matched.

Current statistical approaches can be seen as an extension of the age-earnings profile method. If one selects uninjured workers to be

very similar to the injured workers and uses statistical methods that account for the impact on earnings of the characteristics of workers and their employers, it is possible to estimate future earnings for a group of workers rather precisely. After deriving these estimates of uninjured earnings, the comparison in Figures 3.1 and 3.2 can be made using observed postinjury earnings.

Two different approaches have been used to estimate uninjured earnings: matching and regression. The matching approach uses a comparison group of uninjured workers and attempts to match each injured worker to one or more uninjured workers with similar relevant characteristics in the immediate preinjury period. For example, uninjured workers would be matched to specific injured workers employed in the same workplace at the time of injury who, in addition, were within five years of the age of the injured worker, had the same gender, and had preinjury wages within 10 percent of the injured worker. The idea here is that people with similar characteristics should have similar earnings profiles. So, if their injuries could have been prevented, the earnings of the injured people would have been similar to their uninjured matched counterparts. Although we wouldn't expect this to be true in every case, statisticians have shown that, under reasonable conditions, it will be true on average.

So the average earnings of uninjured workers matched to a specific injured worker can 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 (if any) of the injured worker. This difference produces an estimate of the injured worker's gross earnings losses for each period. These estimated losses can then be 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 regression analysis techniques to generate profiles 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. As with the matching method, the difference between the actual postinjury earnings

of injured workers and their estimated uninjured earnings constitutes their wage losses. These losses can then be averaged for all workers over all observed periods to obtain a measure of average wage losses.

One can reasonably think of the matching method as controlling for differences between injured and uninjured workers before applying the statistical measure to estimate losses, and of the regression method as using information from all injured and comparison workers but then accounting for the differences between them when estimating losses. The estimate of uninjured earnings in both cases is tailored to the characteristics of each injured worker.

## **DATA REQUIREMENTS**

To use either matching or regression methods, researchers need a significant amount of data on many injured and uninjured workers. They need a very large group—thousands—of workers, because individual workers' earnings fluctuate a lot, and much of this fluctuation is unrelated to workplace injuries. Information on many workers is needed so researchers can average out unrelated fluctuations in earnings, allowing accurate estimation of injury-related losses.

Ideally, researchers would have several years of preinjury and postinjury earnings and employment information. The years of observation should be the same for injured and uninjured (comparison group) workers to maximize comparability. The preinjury information is important to establish that the injured and comparison groups have similar uninjured earnings. A long postinjury earnings and employment history is important because the effects of injuries on earnings can be long term and can continue to change for a considerable period after the injury. In addition, the researcher needs access to data on personal and employer characteristics. There must be enough of this information to allow the researcher to control (by matching or regression) for differences between the injured and comparison groups that might affect uninjured earnings.

Because data are needed on thousands of workers, primary data-collection through surveys of employers or workers would generally be prohibitively expensive. For this reason, we look to administrative data sources. No single source is adequate, so estimating lost earnings generally requires matching data from several different sources.

## Earnings and Employment Data

There are two administrative sources for earnings and employment data that have very broad coverage: state unemployment insurance wage records and Social Security Administration (SSA) earnings files. Unemployment insurance records provide quarterly reports of wages and employer identifiers for individuals working in a specific state. About 98 percent of in-state employment is covered, a notable exception being self-employed persons. Earnings are reported quarterly, but hours worked and hourly wages are not reported.

As a result, when earnings change from one quarter to the next, we cannot distinguish between a change in the hourly wage, a change in hours worked per week, or a change in the number of weeks worked in the quarter. In addition, when earnings are reported from more than one employer, we also cannot be sure whether employment was simultaneous (multiple-job holders) or sequential (although the earnings reported in the preceding and following quarters may provide some indication).

State unemployment insurance wage records are confidential, so states will generally limit access and require stringent security and confidentiality agreements. Typically, they only share data with scrambled Social Security numbers and employer identifiers, so any matching of records with other sources must be done by a state agency.

SSA earnings files have rarely been shared with researchers, although the SSA has recently funded a Disability Research Institute and is reportedly in the process of establishing new arrangements for data access through this institute. SSA earnings data are annual, a disadvantage when compared with quarterly unemployment insurance data. It may also be more difficult to match SSA earnings data with employer characteristics, since it is fundamentally a database of individuals. However, SSA data are national and cover self-employed workers, which means that people won't disappear from the database if they move out of state or into self-employment. Only railroad employees, some state and local government workers, and the clergy are excluded from SSA earnings records.

## Employer and Worker Characteristics

Administrative data on relevant employer characteristics are very limited. Probably the best source is state employment security data,

which can be linked to unemployment insurance wage data using the state employer identifier. Employment security data (collected in the ES202 data system) provide four-digit industry category, county of operation, and number of employees. Some states require multisite employers to provide data for each site, but others do not.

Where available, state workers' compensation data may provide the best available source of personal information about injured workers. The breadth and quality of these data vary by state, and several states do not have usable computerized data. Where data are available, they may be available for only a subset of workers' compensation cases. For example, many states that have computerized data systems collect data only for lost-time cases, while others may also collect data for medical-only cases. Few jurisdictions collect data on unsuccessful claims.

Most workers' compensation data systems have information on age, gender, part of body injured, and nature of injury, in addition to the employer at time of injury and earnings data (usually weekly earnings). Some state workers' compensation systems also collect data on occupation, job tenure, and marital status, particularly where this affects the benefit level, as in net wage replacement states. Unfortunately, there is no comparable data source for uninjured workers, although it may be possible for states to get data on age and gender of workers from SSA and to link these data to other files.

Employer, insurer, and third-party administrator data offer potential alternatives to state workers' compensation data. However, these data are very difficult and expensive to collect. Data systems (software and hardware) are not uniform, which adds to the difficulty and expense of building a database. Also, unless coverage rates are very high, there may be questions about whether the resulting sample is truly representative of the state's employed or injured population. However, with great effort it is possible to acquire and utilize data from these sources, as demonstrated by the recent efforts of the Workers Compensation Research Institute in their CompScope™ program (see Telles et al. 2001).

### **Income Replacement Benefits Received**

State workers' compensation agencies typically collect benefit information, and all the caveats that apply to the personal data apply to

benefit data as well. In addition, there may be significant delays between the payment of benefits, reporting of data by employers and insurers, and data entry and processing by the administrative agency. Only a few state data systems record the actual timing of payments. In at least one state, benefit data are not forwarded to the state until the case is closed. In addition, fees paid to claimants' attorneys or other claim expenses often are deducted from payments to the worker, and these fees may or may not be reported in state data.

Most state data systems record only income benefits paid to date. If a case is not resolved when the data are collected, the amount of any future benefit payments will be unknown. In this case, unless data are collected years after injuries occur, recorded benefit payments will be incomplete and benefit adequacy will be underestimated. This is one advantage of insurer data, because it is possible to collect information on reserves for future losses on an individual claim basis.

Compromised or "settled" cases present another problem in analyzing benefit payment data. As described earlier, the lump-sum payment may cover both income and medical benefits, and the amounts of these benefits are not always distinguished. In this case, the researcher must decide how to apportion the payments, so as not to mistakenly classify future medical benefits as wage replacement benefits. Frequently, all compromise payments are treated as income benefits, which may overestimate wage replacement rates in states that allow the compromise of future medical benefits.

## **ALTERNATE MEASURES OF ADEQUACY**

The current "state of the art" in measuring wage replacement adequacy involves securing administrative data on a large sample of workers' compensation indemnity claimants and an even larger sample of potential comparison workers who were not injured. Injured workers should be matched to uninjured workers according to the set of characteristics available, to ensure that they were comparable before the injury occurred.

The losses sustained by injured workers can be estimated by comparing their earnings after the injury, if any, to the earnings of uninjured

comparison workers for the same time period. Aggregate income replacement benefits paid to the injured worker under the workers' compensation program are divided by aggregate estimated wage losses to arrive at an average wage replacement rate.

According to the standard we have adopted, adequacy will be defined as two-thirds replacement of wage losses over the duration of the disability. But the analytical methods that provide the most accurate estimates of uninjured earnings from a statistical perspective may not be feasible in a given state and, even if they are, may not be optimal from a policy perspective. Some states simply may not have the automated workers' compensation data necessary to carry out such studies. In addition, these studies can be costly and time consuming.

Even though these methods develop measures that are closer to true wage losses than other methods, they typically cannot produce up-to-date descriptions of workers' compensation benefit adequacy. That is because it is impossible for such studies to produce results for periods more recent than four to six years ago due to the time needed after the injury to establish future earnings patterns, and the time needed to accumulate the necessary data and perform the analysis. Policymakers typically prefer to base decisions on more current information. This raises the issue of whether alternate methods can produce useful measures of adequacy. We will consider this question in a subsequent chapter.

Chapters 4 and 5 describe, in detail, several different measures of workers' compensation wage replacement adequacy. Chapter 4 uses statutory benefit levels, i.e., those prescribed by statute, without regard to what is actually paid, to determine the relative adequacy of prescribed benefits among states and changes in statutory benefits over time. Chapter 5 describes current state-of-the-art studies that have measured wage replacement adequacy in five states: California, New Mexico, Oregon, Washington, and Wisconsin.

#### **Statutory Workers' Compensation Benefits Method (Chapter 4)**

Benefit structures in workers' compensation are defined by state statute. The statute sets out the weekly benefit amount (as a percentage of the worker's preinjury wage), the maximum and minimum weekly benefit amounts (generally tied to the state's average weekly wage), and (perhaps) a maximum period for collection of benefits. Frequently,

benefit rates differ for temporary total, permanent partial, or other disability levels. Chapter 4 explores these statutory benefit rates by using an identical distribution of injured workers and determining what benefits would have been paid under the statutory frameworks in each state during the period 1972 through 1998. It reports a weighted national average of expected statutory benefits in current dollars, as well as describing the variation among states.

Chapter 4 attempts to standardize losses by using the same distribution of injured workers in each state. This presumes that the variation in statutory benefits is proportional to the wage replacement rates and other benefit parameters in each state. If benefit payments varied in direct proportion to statutory benefits, and the proportion of injured workers receiving workers' compensation benefits were the same across states, the measures presented in Chapter 4 would provide an accurate index of relative benefit adequacy among states. Of course, this measure is still not designed to address the absolute adequacy of any state's benefits. For example, if states generally have inadequate statutory benefits, a state could be above average in its relative adequacy but still provide inadequate benefits by the two-thirds wage replacement standard.<sup>7</sup>

The choice of the distribution of injured workers also can affect the relationship between statutory benefits and adequacy differentially among states. Suppose that one state chose its benefit structure to be most generous to the most common injuries in that state, while another state chose its benefit structure to pay the most inadequate benefits to its most common injuries. A national distribution of injured workers would underestimate the true adequacy of the first state and overestimate the adequacy of the second state. The approach in Chapter 4 also assumes that similarly injured workers in different states would have the same losses. This may not be the case because of differing economic conditions among states or subtle differences in workers' compensation programs.

The value of the statutory benefit measure depends in large part upon whether its underlying assumptions are met. Because of variations in state laws and administrative practices, including such issues as settlement of claims and employers' and/or insurers' authority to terminate benefits, workers may not always receive the amounts specified in the statute. The more the relationship between benefits received and statutory benefits varies across states, the less useful this measure becomes.

The advantages of this method include its relative ease of application and the fact that statutory benefit levels are known at the time of policy discussions about the adequacy of a state's benefits. The statutory benefit method allows us to determine relative generosity among jurisdictions, but it does not allow us to determine whether any given state pays benefits that meet a specific adequacy criterion (e.g., replacement of two-thirds of lost earnings). This is because we cannot know from statutory benefit data what the actual losses or actual benefit payments may be. We only know what the statute says they should be.

### **Lost Earnings Method**

Chapter 5 summarizes recent empirical research that examines the wage losses that individual workers actually incur, and the extent to which these estimated losses are actually replaced by workers' compensation benefits. Our growing ability to construct and analyze large data sets enables researchers to look at individual worker's losses, construct appropriate comparison groups, and compare actual paid benefits of the injured worker with earnings of uninjured workers. The uninjured workers' earnings are used to develop estimates of the counterfactual, i.e., what earnings would have been had the injury not occurred. Estimated losses are then calculated as the difference between each worker's estimated uninjured earnings and observed postinjury earnings. Paid benefits can then be compared to this loss estimate to determine average wage replacement adequacy.

These analyses provide the current state-of-the-art information with regard to the extent to which benefits replace lost wages and are consistent with the conceptual model outlined in this chapter. They provide absolute measures of wage replacement adequacy, not relative measures. However, the lost earnings method also has its limitations. These include cost, delay, and feasibility issues, which will be further explored in Chapter 5.

After we have presented both the statutory benefits method (Chapter 4) and the lost earnings method (Chapter 5) and their empirical results in detail, we will offer some conclusions about the adequacy of wage replacement benefits and methods for their estimation.

## Notes

1. For example, an injured worker might lose a job with health insurance and be hired at a new job with similar wages but without health insurance. Clearly, there has been a significant loss, but it is very difficult to quantify the amount of the loss.
2. State tax rates also vary between jurisdictions. Federal income tax rates on lost earnings for families with more than \$15,000 but less than \$65,000 in annual income would generally be 15 percent, and Social Security (FICA) and Medicare taxes would add another 7.65 percent. In a state with an income tax rate of 5 percent, the marginal tax rate on lost earnings would be 27.65 percent.
3. The adequacy measures using after-tax losses assume that workers who pay less in taxes do not lose government services. While this is often true, it does not necessarily apply to a long-term reduction in the payment of Social Security taxes, for example.
4. Of course, any changes in earnings that are not due to the injury must be distinguished from those that are. Because this is virtually impossible, an analytical method that controls for such differences by using a matched group of uninjured workers has a practical advantage over other methods.
5. Most Canadian provinces have no waiting period, and some jurisdictions in Australia actually impose an “employer offset,” which means the employer directly bears the cost of the first 5 or 10 days of disability.
6. Although even here there are important policy issues, such as how the earnings of seasonal workers or newly hired workers are to be assessed. If the observation period is long, these workers could be disadvantaged. What is the appropriate base-line earnings level for a worker who has an irregular work history?
7. Note, however, that Chapter 4 does compare statutory benefits with benefits calculated under the guidelines of the Model Act (Revised) and the federal poverty standard. These at least provide a yardstick that is external to any particular workers’ compensation system.

# Appendix 3A

## Overview of Methodological Issues

This appendix provides a discussion of some of the methodological issues that are involved in estimating wage replacement adequacy by the lost wages method. This discussion provides a “how-to” guide to the decisions that must be made in preparing such estimates. As such, it also provides a caution about the accuracy of the assumptions that must be made.

**Regression versus matching methods.** Regression and matching methods each have their relative strengths and weaknesses. Perhaps the most important strength of matching methods is that they appear more intuitive to policymakers and thus are easier to explain. In addition, they are more flexible in how they control for differences between the comparison group and the injured group. On the other hand, matching methods may leave groups of workers unmatched and therefore may not provide loss estimates for them, a problem not shared by regression methods.

In matching studies done to date, the proportion of unmatched workers has been much higher for small employers than larger ones. These matching studies have drawn comparison workers from unemployment insurance wage files. Because there are no personal characteristics available on those files, the comparison group has been matched by employer and earnings in the pre-injury year. With small employers, a match is much less likely because there are fewer employees to choose from. For that reason, regression estimates may be more representative of losses for the full range of workers and employers, even if they are less intuitive and harder to explain. Other issues may arise that make one method preferable to the other for practical reasons. For example, if the available comparison group is smaller than or not much larger than the injured group, it may be hard to achieve good matches, so regression-adjustment might be preferred.

**Choice of comparison group.** In estimating losses, we must account for the impact of characteristics that affect both the probability of injury and the level of uninjured earnings. If we do not, differences between the two groups may cause average estimated losses to be higher or lower than actual losses. Researchers therefore try to choose comparison groups so that, when matching or regression methods are applied, omitted or unobserved factors do not affect both injury probability and uninjured earnings. Two different comparison groups have been used in studies discussed in Chapter 5: uninjured workers,

and injured workers with short-duration temporary disability or medical-only claims.

If we believe that unobserved factors that affect uninjured earnings also affect the duration of disability, we may prefer a comparison group of uninjured workers. Suppose, for example, that we expect workers with low preinjury earnings to have longer durations off work than otherwise identical high-wage injured workers. Then workers with short-duration injuries will tend to have higher preinjury earnings. If they constitute the comparison group, we will overestimate preinjury earnings for workers with longer-duration injuries. As a result, we will overestimate losses (which are uninjured earnings minus injured earnings) and underestimate wage replacement rates.

On the other hand, we may believe that injured workers are more similar to each other on unobserved factors that affect earnings than they are to uninjured workers. In this case, we may find the short-term injury group preferable as the comparison group. In either case, the pattern of preinjury earnings, adjusted by matching or regression, should be the same in the comparison and injured groups.

**Treatment of missing earnings data.** If workers have no earnings, they are not generally reported as having zero earnings in unemployment insurance wage records—they are simply not in the database. However, if they move to uncovered employment or to out-of-state employment, or if their employer doesn't report covered earnings, they will actually have earnings that are not reported. When earnings data are missing from administrative sources, researchers have to decide whether to treat the earnings as unknown or as zero. Treating missing earnings as zero will underestimate earnings and, if injured and uninjured workers move into uncovered or unreported jobs at different rates, will misestimate losses. Treating them as unknown, and imputing wages for these individuals, will overestimate average earnings of both injured and uninjured workers to the extent that some of these workers actually had zero earnings. If injured workers are more likely than uninjured workers to actually have zero earnings, losses will be underestimated. Recent studies have tended to treat unreported earnings as zero.

**Inflation.** Wages and benefits should both be analyzed in constant dollars, so that inflation will not distort the picture of earnings losses presented. Using the Consumer Price Index (CPI) is generally accepted as the most appropriate way to adjust for inflation. Researchers should be careful to specify which variant of the CPI is being used and whether it is the national or a regional CPI.

**Treatment of losses after the observed period.** Statistical analysts can estimate losses during the period for which they have data, which is usually from three to five years postinjury. For some workers, however, losses continue long past the observed period. Since injured workers typically average about 36 years of age, these losses can continue over decades. For this reason, losses during the observed period may greatly underestimate lifetime losses. This presents researchers with a problem: do they only calculate losses for the observed period, acknowledging that this will produce a substantial underestimate of lifetime losses, or do they project losses into the future, using unverifiable assumptions about future losses? There is no standard answer to this question, and the researcher (and the reader) must judge what is the most reasonable approach.

**Discounting future losses.** Economists (and others) use present value calculations to compare monetary quantities at different points in time. This represents an acknowledgment that a dollar today does not have the same value as a dollar one year from now. Thus, to generate the “present value” of a stream of lost earnings, future losses must be discounted. Because losses may continue long after the injury, the choice of discount rate can have a substantial impact on the present value. From a social perspective, an appropriate discount rate is the risk-free real interest rate, best approximated by the average yield, after inflation, of six-month Treasury bills or one-year Treasury bonds. Recent studies have used the discount rate chosen by the SSA, which is between 2 and 3 percent annually. The federal Office of Management and Budget (OMB) uses a considerably higher discount rate of 7 percent.

**Generalizability.** When a study is done in Arizona for 1995 injuries, we may feel confident that this study gives an accurate picture of losses and wage replacement for the injuries studied. However, there is no reason to believe that this study would apply to Colorado or New Jersey. Indeed, we might be concerned about whether the results would apply to 1999 injuries in Arizona. At this point, researchers do not know how to generalize studies of lost earnings, although this important issue is a topic of current research. (In a different setting, see Hotz, Imbens, and Mortimer 1999.) With wage loss studies only available for five states to date, we simply do not know how much variation there may be among the states.

**Sensitivity analysis.** Researchers can make different assumptions about, for example, discount rates and ways of projecting losses. There is no “right or wrong” way to make these assumptions. But, the assumptions will have im-

portant influence on the results obtained. Further, these results will be interpreted in a difficult political environment where workers' compensation benefits will likely be a very contentious issue. Therefore, it is always useful to perform a sensitivity analysis to see how results would change under different assumptions.

# Appendix 3B

## Statistical Basis of Loss Estimates

**Conceptual basis of estimates of lost earnings.** Let  $y_{i1}$  represent earnings when person  $i$  is injured, and  $y_{i0}$  earnings when person  $i$  is uninjured. Either of  $y_{i0}$  or  $y_{i1}$ —but not both—can be observed for any person, because we cannot observe the same person at the same moment both injured and uninjured. Let  $I_i$  be an indicator of injury ( $= 1$  if injured,  $= 0$  otherwise). Then the observed outcome for person  $i$  is  $y_i = I_i y_{i1} + (1 - I_i) y_{i0}$ . The injury effect or loss for person  $i$  is

$$(1) \quad \lambda_i = y_{i1} - y_{i0},$$

where time relative to injury is implicit in the specification. We can rewrite the impact of injuries on the injured population as:

$$(2) \quad \lambda |_{I=1} = E(y_{i1} | I_i = 1) - E(y_{i0} | I_i = 1).$$

This cannot be estimated directly since we do not observe  $y_{i0}$ , what postinjury earnings would have been if the injured group had not been injured.

Statistical methods developed in the nonexperimental evaluation literature allow estimation of a change in earnings relative to a counterfactual, in this case relative to what the worker would have received if the injury had not occurred. Typically, nonexperimental evaluation involves comparing a treatment group with a nonexperimental comparison group, which may have different characteristics than the treatment group. We assume selection on observable covariates (Rubin 1974), that is  $\{y_{i1}, y_{i0} \perp\!\!\!\perp I_i\} | X_i$  (where  $\perp\!\!\!\perp$  indicates independence):

$$(3) \quad E(y_{ij} | X_i, I_i = 1) = E(y_{ij} | X_i, I_i = 0), j = 0, 1.$$

In the context of estimating the impact of a workplace injury, injured workers are analogous to the treatment group. The comparison group could be uninjured workers or workers with very minor injuries. The assumption of selection on observables implies that, conditional on the observable covariates,  $X_i$ , there is no systematic preinjury difference between the groups assigned to treatment and control. This allows us to identify the effect of injuries on earnings for the injured:

$$(4) \quad \lambda |_{I=1} = E\{E(y_i | X_i, I_i = 1) - E(y_i | X_i, I_i = 0) | I_i = 1\},$$

where the overall expectation is over the distribution of  $X_i | I_i = 1$ , the distribution of preinjury variables in the injured population.

In the remainder of this section, we will describe three methods of estimating injury-related losses used in the nonexperimental evaluation literature (Rosenbaum and Rubin 1983): matching controls to injured workers on observed covariates, subclassifying on the basis of covariates, or using regression methods to account for the influence of covariates. We then briefly discuss a method to simplify conditioning on covariates: the propensity score. Finally, we consider the problem of bias related to unobserved covariates.

**Matching.** One way of addressing this issue is to match each injured worker to a set of control workers using the relevant covariates. The mean difference between the injured and control workers should then be an unbiased estimator of losses. This method has the advantage of being relatively non-parametric since it does not depend upon distributional or functional form assumptions. The limitation of this method is that appropriate controls for each injured worker may not always be available. This method is used in Reville (1999).

**Subclassification.** This method divides injured and comparison groups into relatively uniform subclasses based on identical or similar values of the covariates,  $X_i$ . In this case, the mean difference within subgroups weighted by the distribution of injured workers ( $I_i = 1$ ) over subgroups, should provide an unbiased estimate of  $\lambda_i$ .

**Regression.** Linear regression assumes linearity and constant effects. In particular, suppose that:

$$E[y_{it} | X_{it}] = \alpha + X'_{it}\beta + \gamma_t \quad \text{and}$$

$$y_{it} = y_{it0} + \delta_t,$$

where  $t$  represents the postinjury period and  $\gamma_t$  is the time effect common to all individuals. Then,

$$(5) \quad y_{it} = \alpha + X'_{it}\beta + I_{it}\delta_t + \gamma_t + u_{it}$$

where  $X_{it}$  denotes covariates of earnings such as age and education that align the earnings of injured workers and uninjured workers in the sample, and  $I_{it}$

denotes an indicator for whether the individual is injured. The goal is to estimate  $\delta_t$ , the difference between the earnings of similar injured and uninjured workers. In this case, rather than balancing the covariates of the injured and uninjured workers by matching or subclassification, we take their impact into account, assuming a linear functional form.

Here,  $u_i$  is independent of  $X_i$  under the assumptions given. Because  $I_i$  is independent of  $y_i$  given  $X_{it}$ ,  $I_i$  is also independent of  $u_i$  given  $X_{it}$ . Therefore, ordinary least squares (OLS) applied to equation (5) produces a consistent estimate of the constant treatment effect,  $\delta_t$ , for a given postinjury period. Thus, we estimate the earnings of workers who are injured under the assumption that they had not been injured by using information from uninjured (or less seriously injured) workers. This is the standard difference-in-differences model, which involves estimating equation (5) on a sample that includes both injured and uninjured workers.

Note, however, that there is no reason to assume that the impact of an injury is independent of all covariates. On the contrary, we expect that some covariates—such as age and tenure—will modify the impact of the injury. In this case, we would need to replace each  $\delta_t$  in equation (5) with a number of interaction terms, reflecting the modifying effect of the covariate on the impact of the injury.

**Selection on unobservables.** A difficulty with the estimation of equation (5) or using the matching or subclassification methods is that the variable  $I_{it}$  may be determined by unobserved covariates that may be correlated with  $u_{it}$ . This may be represented by the following:

$$I_{it} = 1 \text{ if } \gamma_0 + Z_{it}\gamma_1 + \varepsilon_{it} \geq 0,$$

$$I_{it} = 0 \text{ otherwise.}$$

Estimation of equation (5) will lead to misleading results if the  $Z_{it}$  are related to  $u_{it}$  and are not included in the  $X_{it}$ , or if  $\varepsilon_{it}$  is related to  $u_{it}$ , as when, for instance, the quality of the employer–employee match affects both the earnings of the worker and the probability of making a workers' compensation claim.

Econometric techniques for correcting for selection on unobservables (e.g., Heckman 1979) require strong functional form and distributional assumptions. Recent developments in the nonexperimental evaluation literature (Dehejia and Wahba 2002; Heckman, Ichimura, and Todd 1997) suggest that at least in the context of job training, carefully defined comparison groups can considerably mitigate this problem.

## 4

# Statutory Workers' Compensation Benefits, 1972–1998

In the next chapter (Chapter 5), we will review empirical studies examining the extent to which workers' compensation benefits actually replace lost earnings for workers in selected states. As previously indicated, we believe these studies provide the most accurate method of evaluating the performance of state workers' compensation programs against the wage replacement standard of benefit adequacy. However, these studies suffer from three significant weaknesses.

First, there is a necessary lag between the occurrence of an occupational injury and the time at which the full extent of the worker's subsequent wage loss (and benefit experience) becomes known. In addition, data collection and analysis is itself a time-consuming process, which means that it is difficult to evaluate the impact of a change in statutory benefit parameters (or other aspects of the workers' compensation program) on wage replacement adequacy until several years have passed. Thus, the information may not be timely.

Second, the cost and research effort required for these studies precludes an ongoing and comprehensive evaluation of more than 50 separate workers' compensation programs. Thus, the information (from another jurisdiction) may not be relevant. Third, many states lack the data necessary to conduct a wage loss study, either because the workers' compensation benefits data are not readily available in computerized records, or because there is no practical way to link benefits data to earnings data for individual cases. Thus, the information may not exist.

In the absence of such studies, policymakers in the past have relied on other means of evaluating benefit adequacy. These methods include interstate comparisons of a limited number of statutory parameters, such as the maximum weekly benefit paid for temporary total disability; actuarial evaluations of the expected benefits given a wider range of statutory benefit parameters; and the actual workers' compensation benefits paid to injured workers on a per employee or per injury basis.

Each of these methods has advantages and disadvantages as a measure of wage replacement benefit adequacy. In this chapter we examine

the first two of these, as they have had the least attention in the literature.<sup>1</sup> Specifically, we examine statutory benefit parameters, both as a means of evaluating performance with respect to the earnings replacement objective and as a method for measuring social benefit adequacy. Our inquiry will seek to establish whether these simple measures tell us a different story than that of the next chapter, and to decide whether that is an advantage or a disadvantage.<sup>2</sup>

### **TTD MAXIMUM BENEFIT**

Perhaps the simplest (and least costly) means of evaluating state workers' compensation programs is to compare important and well-understood statutory parameters across states. One widely used parameter for this purpose is the temporary total disability (TTD) weekly benefit maximum. As indicated in Chapter 1, TTD benefits are equal to a proportion of the injured worker's preinjury wage, subject to minimum and maximum weekly benefit levels.

While workers' compensation programs pay several other kinds of cash benefits, TTD benefits are a useful measure of overall benefit generosity for a number of reasons. First, they are paid to nearly all claimants who receive wage replacement benefits due to an occupational accident or injury. Whether they eventually qualify for other benefits, claimants generally begin on TTD benefits. Second, the formulae for TTD benefits are less complicated (i.e., determined by fewer parameters) than the formulae for other types of cash benefits, such as permanent partial disability (PPD) compensation. Thus, it is easier to capture differences in benefit generosity for TTD claims using a limited number of statutory parameters.

To be eligible for TTD benefits, the injured worker must experience a period of total disability for more than a statutorily defined period (termed a waiting period), which is typically three to seven days in U.S. jurisdictions. If disability continues beyond the waiting period, the claimant will receive benefits equal to a statutorily defined proportion of his or her preinjury wage, termed the nominal replacement rate. The effective replacement rate may be more or less than the nominal replacement rate because benefits are subject to the minimum and maximum

weekly benefit amounts. If the claimant's disability continues for more than another statutorily defined period (termed the retroactive period), which is typically 7 to 14 days in duration, the claimant will receive compensation benefits for the waiting period as well. Finally, in some states the duration of TTD benefit payments may not exceed a statutorily prescribed maximum, ranging from 104 to 500 weeks (2 to almost 10 years).

Thus, the generosity of TTD benefits is determined by six parameters: 1) the nominal replacement rate, 2) the weekly benefit maximum, 3) the weekly benefit minimum, 4) the waiting period, 5) the retroactive period, and 6) in those minority of states that statutorily limit TTD duration, the maximum duration. However, there is limited variation in the waiting periods and replacement rates across states. And the weekly benefit minimum, retroactive period, and maximum TTD duration affect only a small proportion of compensation claimants. Thus, the TTD weekly maximum is probably the most common summary indicator of the relative generosity of TTD benefits across states.

Nonetheless, by itself the TTD maximum provides little information about whether workers' compensation benefits are adequate according to either definition of adequacy described in Chapter 2. However, the comparison of the TTD maximum to the poverty thresholds is a potentially useful measure of the social adequacy of workers' compensation benefits that has some historical significance because it was one of the measures used in the *Report of the National Commission on State Workmen's Compensation Laws*.<sup>3</sup>

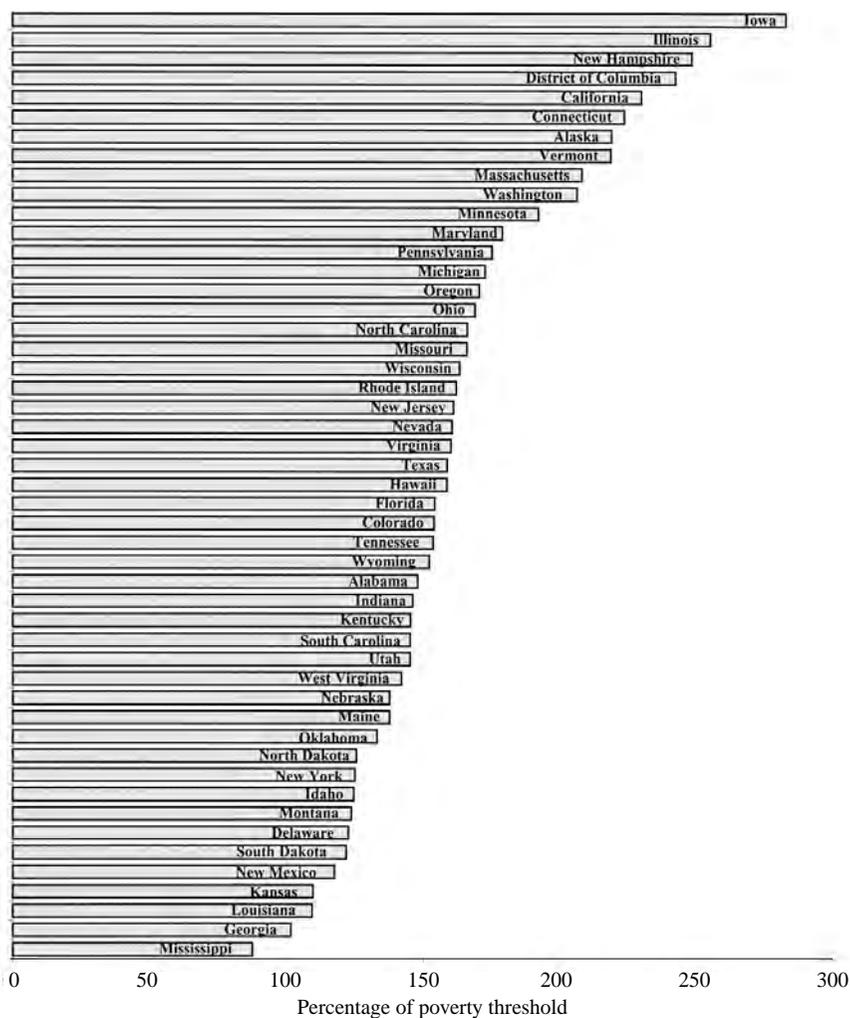
Figure 4.1 provides data on the ratio of the TTD maximum to the poverty threshold for state jurisdictions plus the District of Columbia for the years 1972 through 1998. These data indicate that, on average, the TTD maximum increased relative to the poverty threshold over this period, from about 100 percent of the threshold in the early 1970s to more than 160 percent of the threshold by the end of the 1990s. Figure 4.2 presents interstate comparisons of the TTD maximum/poverty threshold comparison for the year 1998. The figure shows substantial variation among states as the TTD maximum relative to the poverty threshold ranges from just less than 90 percent for Mississippi to more than 280 percent for Iowa.

The comparisons depicted in Figures 4.1 and 4.2 are useful in that the poverty level represents a potential criterion against which the so-

**Figure 4.1 Temporary Total Disability Maximum Relative to the Poverty Threshold, 1972–1998**



**Figure 4.2 Temporary Total Disability Maximum Relative to the Poverty Threshold, by State, 1998**



cial adequacy of workers' compensation benefits may be judged. For example, one could argue that for workers' compensation benefits to be socially adequate, the TTD maximum should be equal to or greater than the poverty threshold. Using this standard, the data in Figures 4.1 and 4.2 indicate that there is not a serious problem with respect to the social

adequacy of workers' compensation benefits. All states—except Mississippi—had socially adequate maximum benefits by this standard in 1998.

## **AVERAGE WEEKLY TTD BENEFITS**

While the weekly TTD benefit maximum is a readily available measure of workers' compensation benefits, it has obvious weaknesses. As we have shown, it is only one of the parameters that determine the generosity of TTD benefits. If we believe that socially adequate workers' compensation benefits would provide the injured worker with income sufficient to avoid impoverishing the worker and his or her family, then the TTD maximum is a poor measure, as most workers eligible for TTD benefits receive a weekly amount that is less than the maximum. Thus, it is arguable that the average weekly TTD benefit provides a better measure of social adequacy. Accordingly, we calculated the average weekly TTD benefit using the following methodology.

### **Methodology**

First, a wage distribution for each state was constructed for each year by centering a national wage distribution on the average weekly wage paid to workers covered by unemployment insurance in the state during the year.<sup>4</sup> The weekly benefit paid to each worker in this distribution was calculated according to the nominal replacement rate and benefit minimums and maximums in effect in each particular state during a particular year.<sup>5</sup> We then calculated the average weekly benefit for each state and year by averaging across all workers in the hypothetical distribution.

In some jurisdictions, the weekly benefit payment varies according to the claimant's family and/or dependent status, i.e., whether the claimant was married and had children. In those instances, a distribution of fatal compensation claims by family status—which is described in more detail below—was used to represent the distribution of family

types. This was combined with the wage distribution using appropriate weights, benefits were then calculated for each claim in the combined wage and family type distribution, and an average was taken for the entire claim distribution.<sup>6</sup>

For several states, benefits are based on spendable or after-tax income. In those cases, the before-tax wage distribution was converted to an after-tax distribution by deducting estimated federal and state income taxes as well as FICA. These taxes were calculated on the basis of the claimant's presumed tax status given the number of dependents assumed by the combined wage-family status distribution. Once again, benefits were calculated for each claim in the distribution and an average was taken.

## Results

Figure 4.3 presents national data on the ratio of the estimated average weekly workers' compensation benefit paid to workers who are temporarily and totally disabled to the poverty threshold for a family of four for the period 1972–1998. These data indicate that the average weekly TTD benefit for the nation as a whole increased from 80 percent of the poverty threshold in 1972 to a little less than 110 percent in 1998. The interstate variation in social adequacy is illustrated by the data reported in Figure 4.4, which depicts the ratio of the TTD average weekly benefit to the poverty level for individual states in 1998. While there has been significant progress, these data indicate that 16 states still paid an average TTD benefit that was less than the poverty level in 1998.

Interestingly, a comparison of these data with those in Figure 4.2 show that the identification of a particular state as adequate or inadequate sometimes depends upon the measure used. For example, using the TTD maximum as a standard, Iowa had the most generous benefits in the nation in 1998, but Iowa benefits actually fall below the poverty standard when measured using the average weekly TTD benefit. This difference between the generosity of the maximum and the generosity of average TTD benefits is explained by two facts: 1) Iowa is a relatively low-wage state (ranking 39th in the nation in 1998), and 2) Iowa uses a spendable earnings benefit formula with relatively high marginal tax rates for upper-income workers.

**Figure 4.3 Average Weekly TTD Benefits Relative to the Poverty Threshold, 1972–1998**

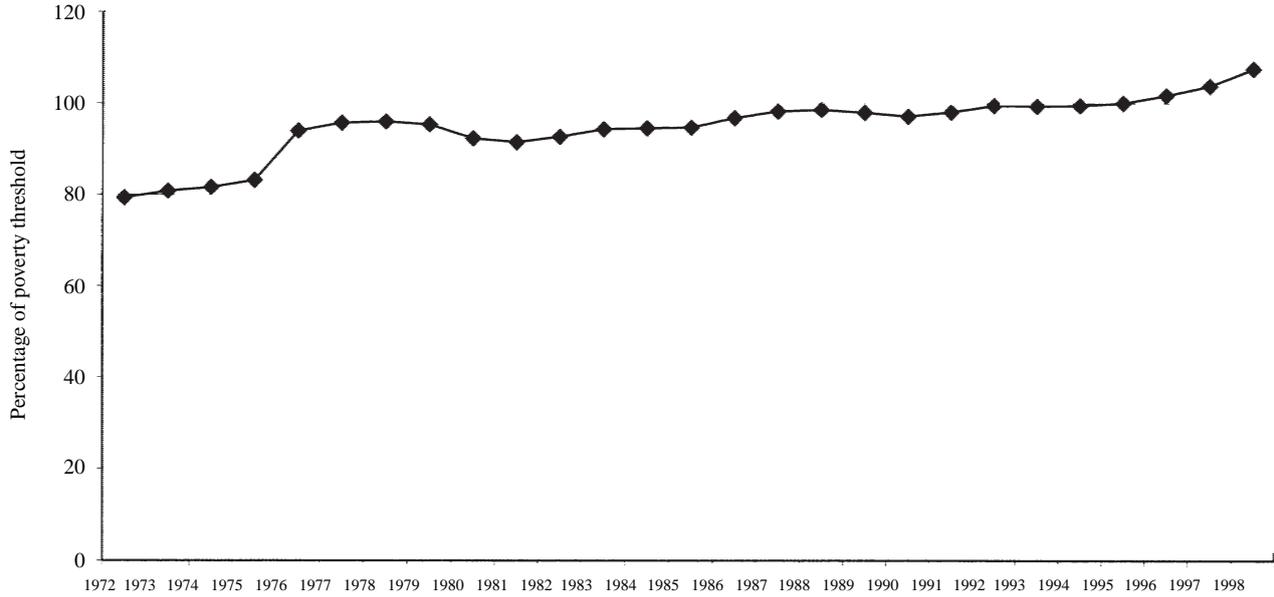
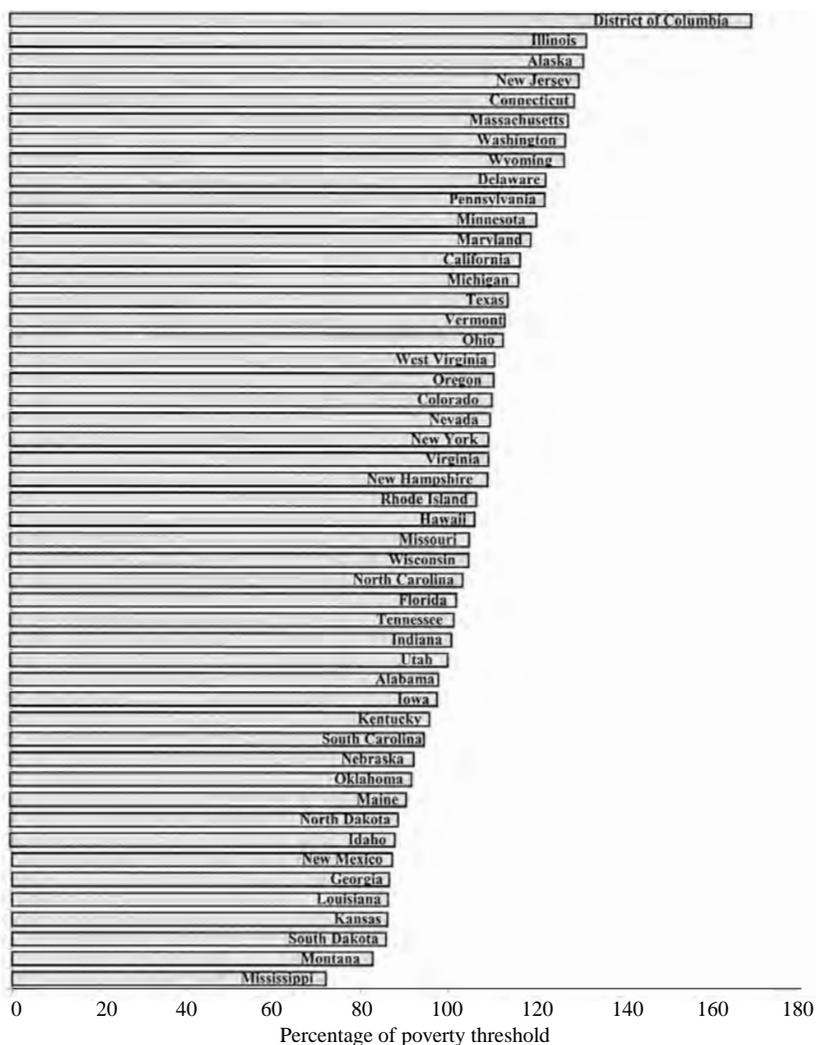


Figure 4.4 TTD Weekly Average Relative to the Poverty Threshold, 1998



## EXPECTED STATUTORY BENEFITS

In the previous sections, we moved from a simple measure of adequacy based on a single parameter that determines the generosity of one type of cash benefits (the maximum weekly TTD benefit) to a more

comprehensive measure—using additional parameters—of that same type of benefits (the average weekly TTD benefit). While generally correlated, these measures lead to different conclusions about the relative generosity of workers' compensation benefits. We may infer that it would be possible to further improve our evaluation of wage replacement benefit adequacy by developing measures that include additional statutory benefit parameters and other benefit types.

In this section, we construct a comprehensive measure of cash benefit adequacy incorporating all benefit types and using a more complete set of statutory parameters. To do so, we use a national distribution of workers' compensation claimants to estimate the expected average statutory benefit for a disabled workers' compensation claimant who experiences at least one day of disability. We calculate this expected statutory benefit for each state and year from 1972 to 1998. This claimant distribution, which was obtained from the National Council on Compensation Insurance (NCCI), has several dimensions, including the preinjury wage rate, the severity of disability, and the claimant's marital and family status.

## **Methodology**

To estimate expected workers' compensation benefits, we first calculated the benefit payable to four different types of claims: temporary total disabilities (TTDs); permanent total disabilities (PTDs); permanent partial disabilities (PPDs); and fatalities (fatals). These claim types correspond to the classification scheme typically utilized by state workers' compensation programs. For each claim type, expected benefits are equal to the product of the average weekly benefit paid to the claimant and the average duration of benefit payments in weeks. Both components, the weekly benefit payment and benefit duration, were calculated separately using appropriate wage or duration distributions and then were multiplied together to obtain the total expected benefit amount for each claim type. These separate claim type estimates were then combined, using a national distribution of claims by type, to produce an overall average expected benefit estimate for all disabling injury and illness claims. In the remainder of this section, we will describe the methods used to calculate each component of the overall estimate.

### **Weekly benefit**

Similar methods were used to calculate weekly benefits for all four claim types. The calculation of average weekly benefits for PTD, PPD, and fatal claims is identical to that for TTD claims described above, except for two additional adjustments. First, in some states weekly benefit payments are reduced by coordination with other insurance benefits, most notably Social Security Old Age and Survivors Insurance (OASI) and Disability Insurance (DI) benefits. The amount of the reduction, known as an offset, was calculated for each claim in the combined wage-family status distribution to determine the Social Security monthly benefit due the claimant, which was converted to a weekly amount. We assumed that Social Security disability insurance benefits only applied to PTD claims, that Social Security retirement and survivor benefits only applied to PTD and fatal claims, and that other offsets (such as unemployment insurance) were not applied to any workers' compensation benefit.<sup>7</sup>

Finally, in a few states the weekly benefit is indexed to the cost of living or the state's average weekly wage. In those states, we inflated the weekly benefit of PTD, PPD, or fatal claims as appropriate to account for inflation. If benefits were indexed to the CPI, benefits were arbitrarily increased by 4 percent annually. If benefits were indexed to the state's average weekly wage, we assumed a 6 percent inflation rate for benefits.

### **Temporary Total Disability Duration**

Depending on the jurisdiction, two statutory parameters limit the duration of TTD benefits. First, in all states, claimants do not receive payment for the first few days of disability—known as a waiting period, which lasts 3 to 7 days—unless their disability continues for a longer period—known as the retroactive period, which is usually 10 to 14 days. Second, a handful of states either limit the number of weeks the claimant may collect TTD benefits or limit the total dollar amount of benefits the claimant may collect.

We applied the statutory parameters with respect to the waiting and retrospective periods, as well as any limits on TTD duration of benefits to a distribution of TTD claims by duration (provided by NCCI) to calculate the average TTD duration for each state and year. This estimated

average duration was multiplied by the calculated average weekly benefit to yield the estimated total benefits paid to TTD claims.

### **Permanent Total Disability Duration**

Some jurisdictions limit the duration of PTD benefits (in weeks) or the total dollar amount of benefits paid. Unless such a limit was specifically mentioned in the statute, we assumed that benefits were paid for life. In either case, we determined the duration of PTD benefits using an age distribution of PTD claims and mortality information provided by NCCI. Expected benefit duration, discounted at 3.5 percent and adjusted for mortality, was calculated for every claimant in the age distribution, and was then multiplied by the average weekly benefit to obtain expected total benefits.

Where PTD benefits are offset by SSDI benefits, the benefit period is divided into four periods: 1) a six-month waiting period during which we assume the claimant receives no Social Security benefits; 2) a period during which the SSDI benefit includes dependency benefits for dependent children (for those claimants with dependent children); 3) a period after the children are presumed to have reached majority during which only the basic SSDI benefit is paid; and 4) a period, beginning at age 65, when SSDI benefits are no longer paid.<sup>8</sup> A separate benefit duration is calculated for each of these periods, adjusted for mortality and discounted to the present at 3.5 percent; each component is multiplied by the applicable weekly benefit for that period, to estimate the present value of lifetime benefits.

Where Social Security retirement benefits offset workers' compensation payments, benefit duration is broken into two subperiods: before and after age 65. A separate duration is calculated for each subperiod, adjusted for mortality and discounted at 3.5 percent, and then multiplied by the appropriate weekly benefit (offset or not offset).

### **Permanent Partial Disability Duration**

Most state statutes recognize two different types of PPDs: scheduled and nonscheduled. Scheduled PPD benefits are typically paid to claimants who have suffered injuries to a particular body part (such as an arm or toe). The maximum duration of scheduled benefits for the

loss or loss of use of a particular body part is specified by statute. For example, in New York claimants who lose the use of a leg are entitled to 288 weeks of benefits, whereas claimants who lose an arm are entitled to 312 weeks of benefits. In the event of a partial loss of a member or other scheduled body part, benefits are prorated based on the amount specified for the entire loss, so that a New York claimant who has suffered a 25 percent loss of an arm is entitled to 78 weeks of benefits, or one-fourth of the full allotment.

The basis for nonscheduled PPD benefits—that is, PPDs involving a body part that is not specifically mentioned in the statute—varies widely among states (see Barth and Niss 1999). In some states, nonscheduled benefits are based on the extent of functional impairment—essentially a medical determination (19 jurisdictions). Other states require an evaluation of the claimant’s lost wage-earning capacity resulting from the injury (13 jurisdictions). In 10 jurisdictions, nonscheduled benefits are proportional to the extent of actual wage loss, i.e., the difference between the claimant’s pre- and postinjury wage. There are also several ways of estimating future wage loss, some of which may result in little difference from lost wage-earning capacity methods in practice. Finally, 9 states use what Barth and Niss term a “bifurcated” approach. Workers who have returned to work are rated for impairment, while other workers are rated for loss of wage-earning capacity.

In some states, the limit on nonscheduled PPD duration is identical for all such injuries, regardless of severity, while in other states the limit varies according to the severity of the injury (i.e., the extent of lost wage-earning capacity or functional impairment). In short, there are very few general statements that hold true for all state systems used to determine PPD benefits.

For functional impairment or the lost earning capacity jurisdictions, we utilized a national distribution of PPD claims, by body part and the degree of functional impairment.<sup>9</sup> For wage loss states, we used a wage loss distribution provided by Berkowitz and Burton (1987) to determine the extent of wage loss associated with a given degree of functional impairment. This average wage loss figure was then linked with NCCI’s PPD distribution to create a wage loss distribution for PPD claimants.

Statutory information was combined with the resulting PPD distribution (wage loss, earning capacity, or functional impairment) to deter-

mine average disability duration. Similar to PTD claims, PPD benefit duration was adjusted for mortality and discounted at 3.5 percent. Once again, we multiplied average benefit duration by the average weekly benefit to obtain the expected total benefit for PPD claimants.

### **Fatal Benefit Duration**

While states pay fatal injury benefits to a variety of dependents, NCCI claim data indicate that over 95 percent of all fatal work injury claims involve workers with no dependents entitled to benefits, workers whose sole dependents are their spouses, or workers whose sole dependents are their spouses and children. Consequently, our fatal benefit estimates were based only on these three categories of fatal injury claims.

In most states, fatal injury compensation is paid to the spouse until the event of his or her death or remarriage, while fatal benefits are paid to children of the deceased worker until the age of majority.<sup>10</sup> Most states also pay a lump sum amount, typically equivalent to two years of benefits, to a spouse who remarries. In some jurisdictions, there is a limit on the duration of fatal benefit payments (in weeks) or on the total amount of benefits paid to all dependents. Finally, all states pay for funeral benefits up to a specified maximum. We assumed that in every case, maximum funeral benefits were paid.

NCCI provided us with a distribution of fatal injuries by family status, i.e., the proportion of fatal claims involving no dependents, a spouse as the only dependent, a spouse and one child, etc. These data were combined with statutory parameters to determine an average fatal benefit duration. This was adjusted for mortality and the probability of remarriage and discounted at 3.5 percent. The estimated duration was then multiplied by the average weekly benefit to obtain an estimated average total benefit for fatal claims. We also included an expected lump sum settlement amount as well as the maximum payment for funeral expenses.

In some states, the weekly benefit payment varies with the number of dependents. For example, in Alabama the replacement rate for a spouse with no dependent children is 50 percent of the preinjury wage, while for a spouse with dependent children, the replacement rate is two-thirds of the wage. In these cases, we calculated two average dura-

tions for fatal benefits—the duration before the children reached the age of majority and the duration thereafter—and two average weekly benefit payments for those claimants with dependent children, one based on the amount paid to a spouse with no dependent children, and the other based on the amount paid to a spouse with dependent children.

## RESULTS

Figure 4.5 reports the national average expected wage replacement benefit for workers' compensation claimants in the United States, as calculated using the methodology described in this section, for the period 1972 through 1998. Once again these are weighted results, using state employment covered by unemployment insurance as state weights, and reported in constant 1998 dollars.<sup>11</sup>

The data in Figure 4.5 show that in 1972, the average workers' compensation claimant could expect to receive slightly more than \$8,500 in wage replacement and other cash benefits (in 1998 dollars) as the result of his or her work injury. By 1998, average expected workers' compensation benefits had risen to slightly more than \$11,000, a 30 percent increase in real expected benefits. As can be seen, most of this increase occurred between 1972 and 1976. Benefit levels have remained relatively constant since that time, with a small rise at the end of the period.

The immediate post-1972 increase in benefits is probably attributable to the effect of the Report of the National Commission on State Workmen's Compensation Laws, which recommended a number of changes to state law liberalizing benefits, and which recommended federal standards for state workers' compensation programs if they failed to improve benefits.

Figure 4.6 depicts statutory benefit generosity for individual states in 1998. The data in this figure show that expected statutory benefits for a workers' compensation claimant in 1998 ranged from a little more than \$30,000 for the average injured worker in the District of Columbia to less than \$5,000 for (hypothetically) identical injured workers in Louisiana, a sixfold difference.

**Figure 4.5 Real Average Expected Statutory Benefits, 1972–1998**

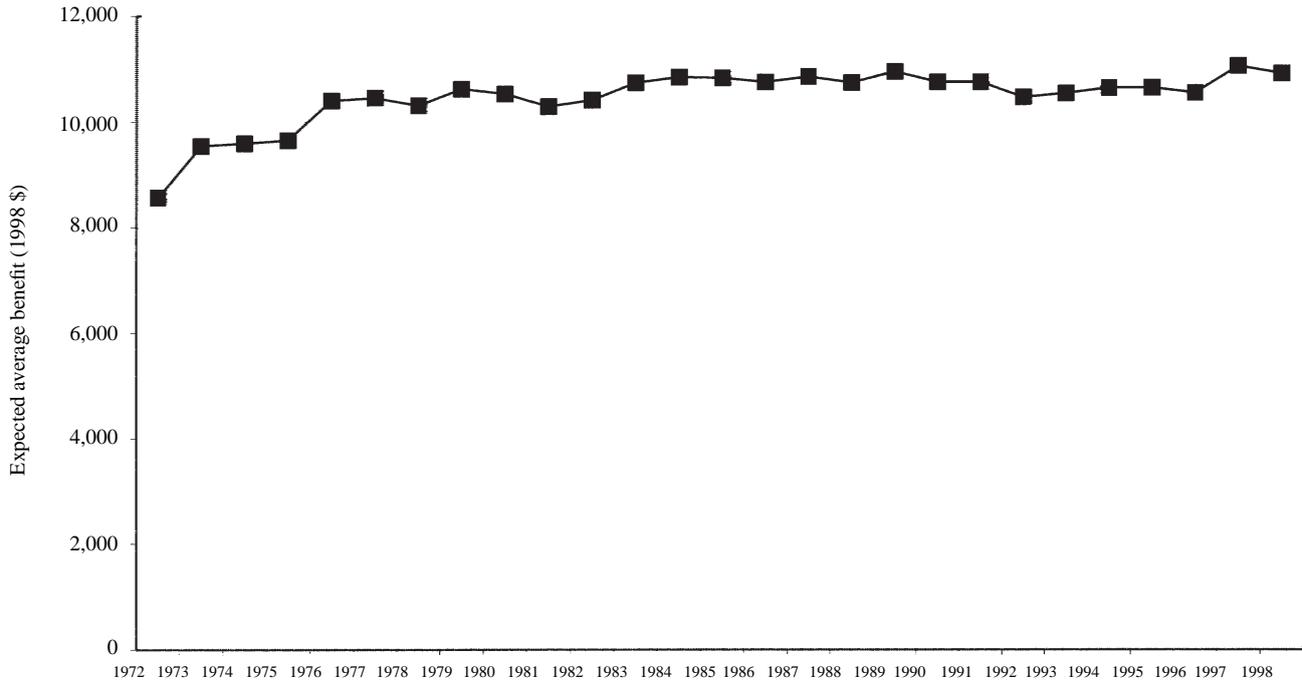
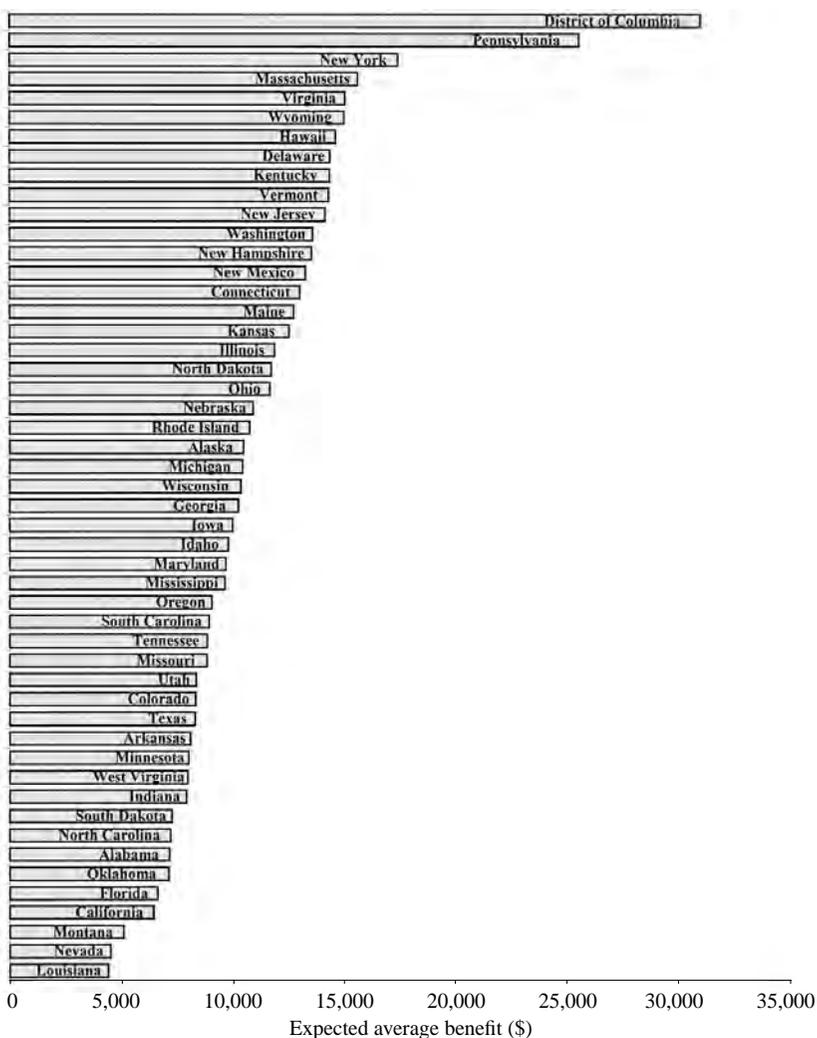


Figure 4.6 Expected Statutory Benefits, by State, 1998



While these data provide some useful information about the relative generosity of workers' compensation benefits over time and across jurisdictions, they fail to inform the question of adequacy, which is the central issue of this volume. To evaluate benefit adequacy, we must compare these benefit estimates against some standard. In the remainder of this chapter, we will present data that evaluate these expected

statutory benefit statistics using two criteria: the benefits that would be paid under the provisions of the Model Act (Revised) promulgated by the Council of State Governments in the mid 1970s, and the benefits compared to the wage loss experienced by workers' compensation claimants according to NCCI's national distribution of work injuries.

## **COMPARISONS WITH MODEL ACT (REVISED) BENEFITS**

The Model Act (Revised) (hereafter Model Act) is one possible standard with which to compare the statutory benefits of state workers' compensation programs. The benefit provisions of the Model Act from 1974 are presented in Appendix 4A to this chapter. The provisions of the Model Act reflect a consensus among many workers' compensation stakeholders about wage replacement benefit adequacy from the period shortly after the NCSWCL's report. In the intervening period of more than 25 years, we judge that employers in particular have revised their conceptions about benefit levels in light of the experience when states implemented the commission's recommendations. They now maintain that benefit levels must be looked at in terms of the entire workers' compensation law and utilization experience and not on a "stand alone" basis.

The Model Act comparison is based on a two-step calculation. First, we calculate the expected benefits that would be paid to each state's workers' compensation claimants in each year between 1972 and 1998 according to the provisions of the Model Act. This calculation is identical to that used to estimate expected benefits as described in the previous section, except that the parameters defined by Model Act provisions substitute for the state's actual statutory parameters. Importantly, each jurisdiction's average weekly wage in each year is used to compute benefits under the Model Act. Second, we take the ratio of the state's expected benefits, as described in the previous section, to the state's expected benefits under the Model Act. The result represents the proportion of Model Act wage replacement benefits that would be paid in each state under its statutory provisions, with 100 percent representing equality of benefits with the Model Act.

Data comparing expected benefits paid under the actual statutory parameters in effect at the time with the benefits that would have been

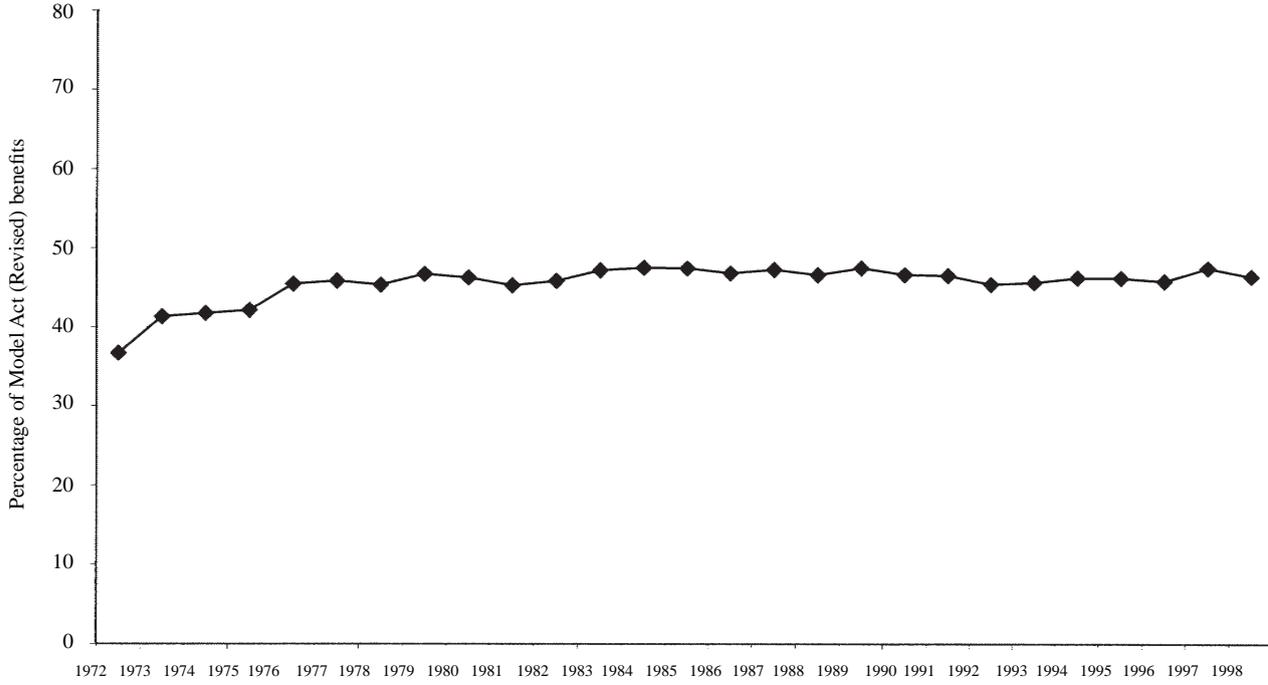
paid under the provisions of the Model Act are presented in Figures 4.7 to 4.9. Since Model Act benefit provisions remain constant throughout the period, the data in Figure 4.7 unsurprisingly mirror those shown in Figure 4.5. The results from Figure 4.7 show that the ratio of actual to Model Act benefits increased somewhat during the first five years of the period, rising from slightly less than 40 percent of the benefits that would have been paid under the Model Act in 1972 to about 45 percent in 1976. The ratio of actual statutory to Model Act benefits fluctuated narrowly between 45 and 48 percent over the remainder of the period. The average state has never exceeded 50 percent of the benefit level prescribed by the Model Act, and several states do not achieve 25 percent in 1998.

Figure 4.8 depicts the performance of individual states against the Model Act criterion as of 1998. Once again, there is substantial variation among states that is similar to the results presented in Figure 4.6. The differences between these two measures may be explained by the differences in wage levels across states. High-wage states have high expected statutory benefits, which means high-wage states tend to be ranked high in Figure 4.6. However, high-wage states also have high benefits when the Model Act is used to calculate benefits for the state, and so the ratio of actual benefits to Model Act benefits is dampened for high-wage states. Thus, we see that in Figure 4.6, New York has expected benefits that are ranked third most generous in the nation, while according to the data in Figure 4.8, New York ranks 14th in the nation in the ratio of expected benefits to Model Act benefits. Among other things, this comparison once again illustrates that the evaluation of benefit adequacy depends on the measure employed.

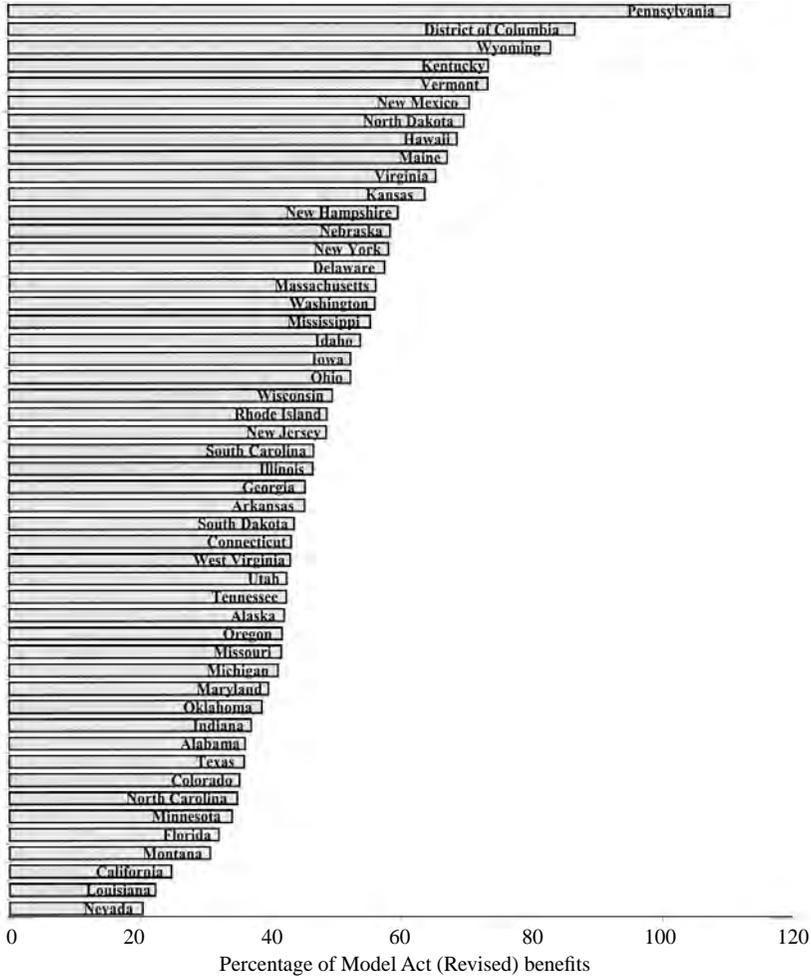
As previously indicated, overall wage replacement benefits paid to workers' compensation claimants is a weighted average of four different types of compensation benefits—TTD, PTD, PPD, and fatals—and different formulae and parameters are used to determine the generosity of each type. This raises the important question of whether there are differences in wage replacement benefit adequacy among different benefit types.

Figure 4.9 depicts national average measures of the ratio of expected statutory benefits to the benefits under the Model Act for the four benefit types as well as the composite "overall" cash benefit measure (designated as "Mean" in the figure) for the period 1972–1998. As can be seen in the figure, there is substantial variation in the adequacy of

**Figure 4.7 Average Expected Statutory Benefits Relative to the Model Act (Revised), 1972–1998**



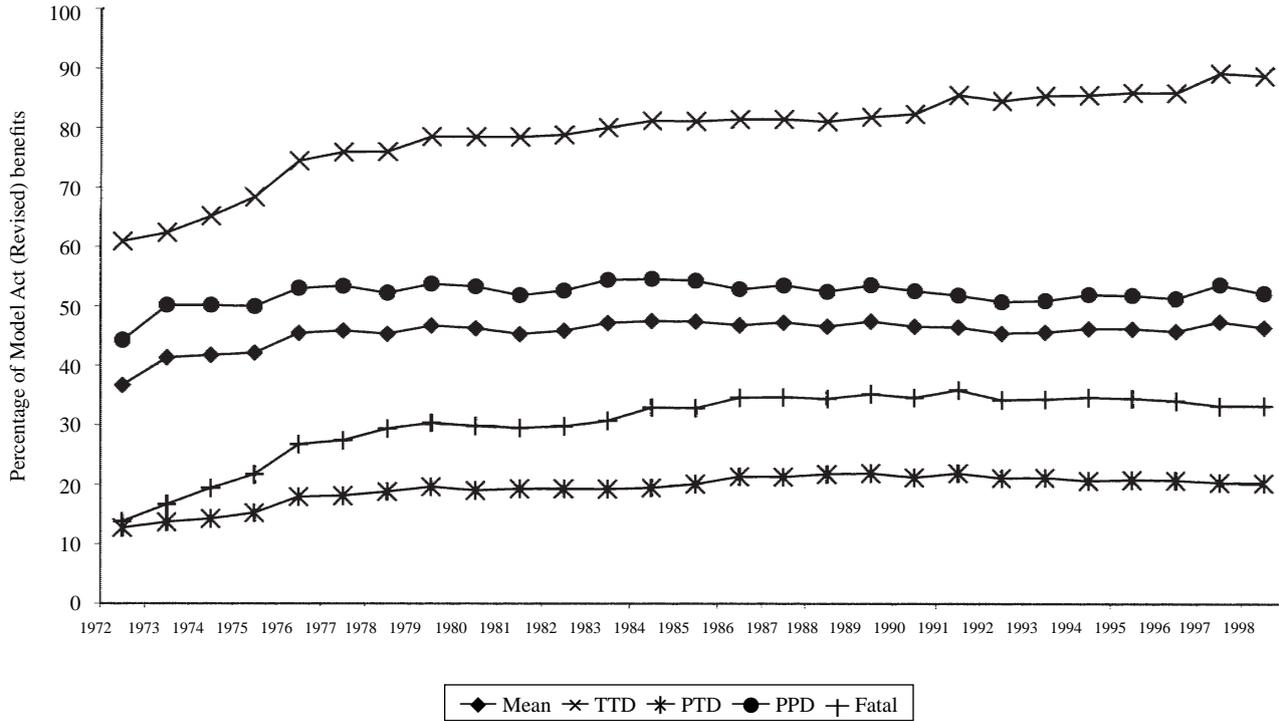
**Figure 4.8 Expected Benefits Relative to the Model Act (Revised), by State, 1998**



wage replacement benefits among these different claim types. When evaluated against the Model Act provisions, TTD benefits appear to be the most adequate, while PTD benefits are the least adequate.

Interestingly, the data indicate that TTD benefits have improved relative to the Model Act throughout the period, reaching nearly 90 per-

**Figure 4.9 Expected Statutory Benefits Relative to the Model Act (Revised), by Type of Benefit, 1972–1998**



cent in the late 1990s. On the other hand, wage replacement benefit adequacy for other benefit types has stagnated or even declined since the mid 1980s. Among other things, this would suggest that a less complicated measure of benefit adequacy, such as the average weekly TTD benefit discussed earlier in this chapter, may be fatally flawed because it fails to reflect important variation in benefit generosity.

## **Replacement Rate**

Another criterion against which to evaluate statutory wage replacement benefit adequacy is the extent to which workers' compensation benefits replace projected or assumed lost wages.<sup>12</sup> In this section, we examine measures of this criterion, using the same NCCI distribution of workers' compensation claims that was used to estimate statutory benefits earlier in the chapter. Specifically, for TTD claims we assumed that claimants suffer a total loss of wage income for the entire period of disability as specified in the TTD duration distribution provided by NCCI. For PTD claims, we assumed that claimants suffered a total loss of wage income for the remainder of their lives. The duration of this loss was determined by an actuarial evaluation of the expected length of life, which depends on the claimant's age as given by an NCCI distribution of PTD claims. For PPD claims, we assumed that claimants suffer a partial loss of wages equal to the disability rating provided by the NCCI PPD distribution and that they suffer this loss for the remainder of their normal working lives (i.e., until age 65). Of course, we recognize that in wage loss states there may be some claimants who have a permanent physical impairment but suffer little or no wage loss. Finally, for fatal claims, we assume that there is a total loss of the deceased worker's wages and that the surviving spouse experiences this loss until death or remarriage.

Given the long-tailed nature of PTD, PPD, and fatal claims, we calculate two different sets of estimates of wage loss for these types of claims. One set assumes that in the absence of the work injury, the worker's wages would have remained static over the remainder of his or her life so that the extent of wage loss similarly remains unchanged. The second set assumes that the injured worker's wage would have grown by 6 percent annually in nominal terms, so that wage loss would have grown similarly over the remainder of the work life (i.e., until age

65). Obviously, this second set of wage loss estimates is substantially greater than the first set.

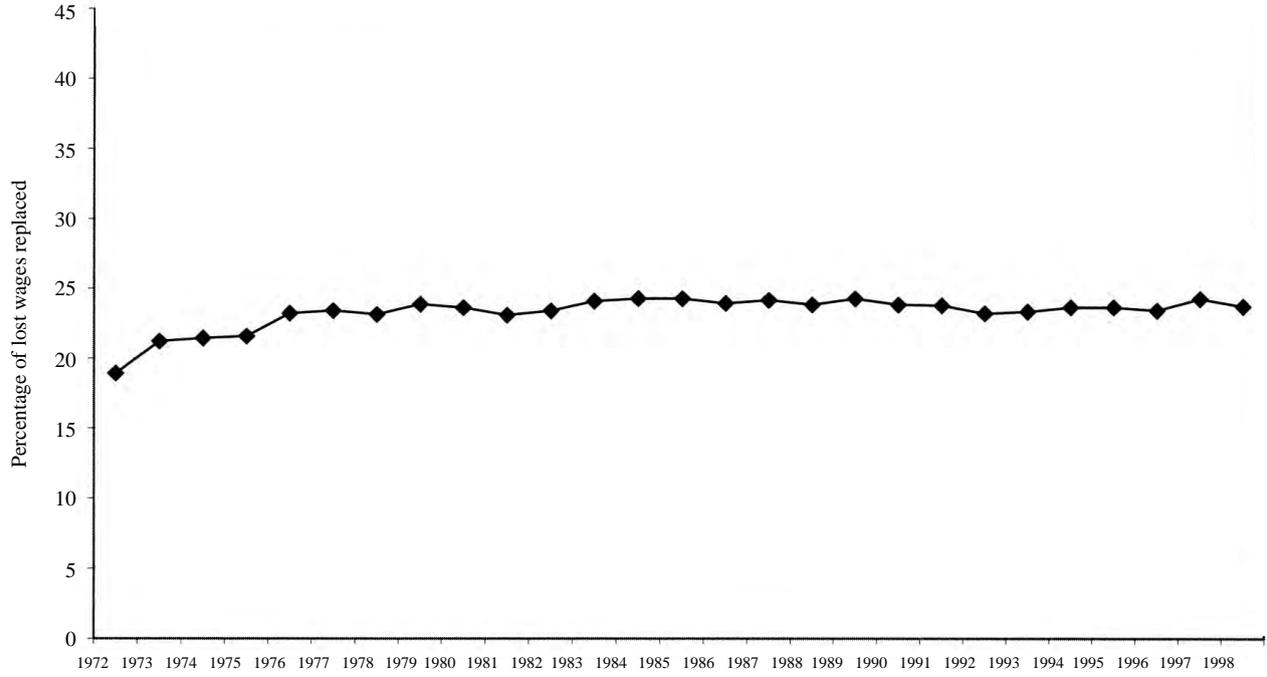
To calculate the wage replacement rate, we take the ratio of expected statutory benefits to expected wage losses. Figure 4.10 presents the national wage replacement rate simulations for the period 1972–1998, using state average estimates that assume that wage loss remains static over the course of the workers' working life. The figure shows that the pattern of these estimates is similar to those previously reported for expected statutory benefits and those same benefits relative to Model Act benefits. The data suggest that in 1972 state workers' compensation programs replaced a little less than 20 percent of total lifetime wage losses. This number rose to about 28 percent in 1985 before trending downward, reaching a little less than 26 percent in 1998. If we believe that benefits should replace two-thirds of lost wage income, then average workers' compensation benefits for the nation as a whole must be considered inadequate.

Figure 4.11 presents individual state wage replacement simulations for 1998. Once again, these data reveal considerable variation in adequacy across jurisdictions, ranging from a 57 percent replacement rate in Pennsylvania to a 10 percent rate in Nevada. It is also clear that the simulated wage replacement rate provides a ranking of states that is nearly identical to that given by the Model Act ratio reported in Figure 4.8.

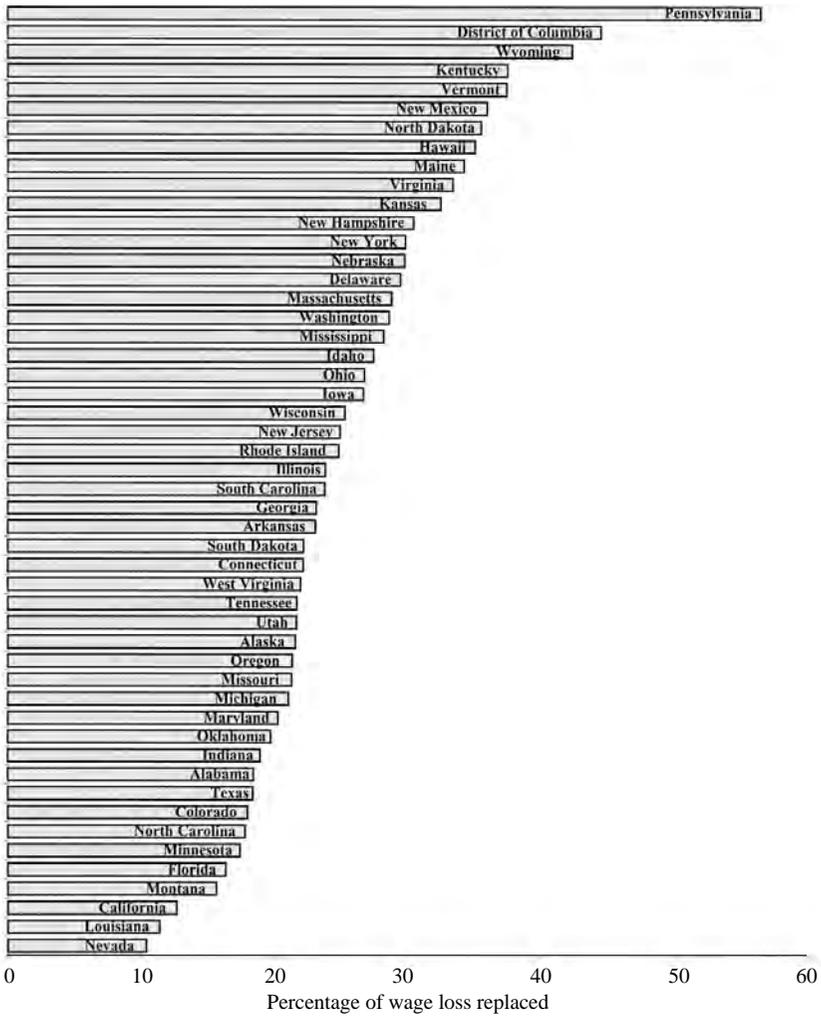
Figure 4.12 depicts national average data on the simulated wage replacement measure assuming that wage loss increases over the course of a permanently disabled claimant's working life, or the period of dependency of a surviving spouse. These estimates indicate that wage replacement benefits replaced only about 10 percent of projected lifetime lost earnings in 1972. This figure rose to more than 14 percent in the early 1980s before falling back to just over 13 percent in the late 1980s and 1990s. These estimates of wage replacement rates are even lower than those based upon actual earnings of comparison workers in Chapter 5 because the simulated earnings used here are not subject to the normal vagaries of the labor market (unemployment, illness, etc.).

Finally, Figures 4.13 and 4.14 report estimated national average wage replacement rates by benefit type during the study period. Figure 4.13 reports the result of simulations that assume that wage loss remains static, while Figure 4.14 reports simulations that assume that

**Figure 4.10 Simulated Average Replacement Rates, 1972–1998**



**Figure 4.11 Simulated Expected Replacement Rates, by State, 1998**



wage loss increases over time. These two figures reveal substantial variation in wage replacement adequacy among benefit types. Figure 4.13 shows that the simulated wage replacement benefit was most nearly adequate for PTD injuries and least adequate for PPD claims. Simulated average wage replacement rates exceeded 55 percent for TTD

**Figure 4.12 Simulated Average Replacement Rates, Inflation-Adjusted Wage Loss, 1972–1998**

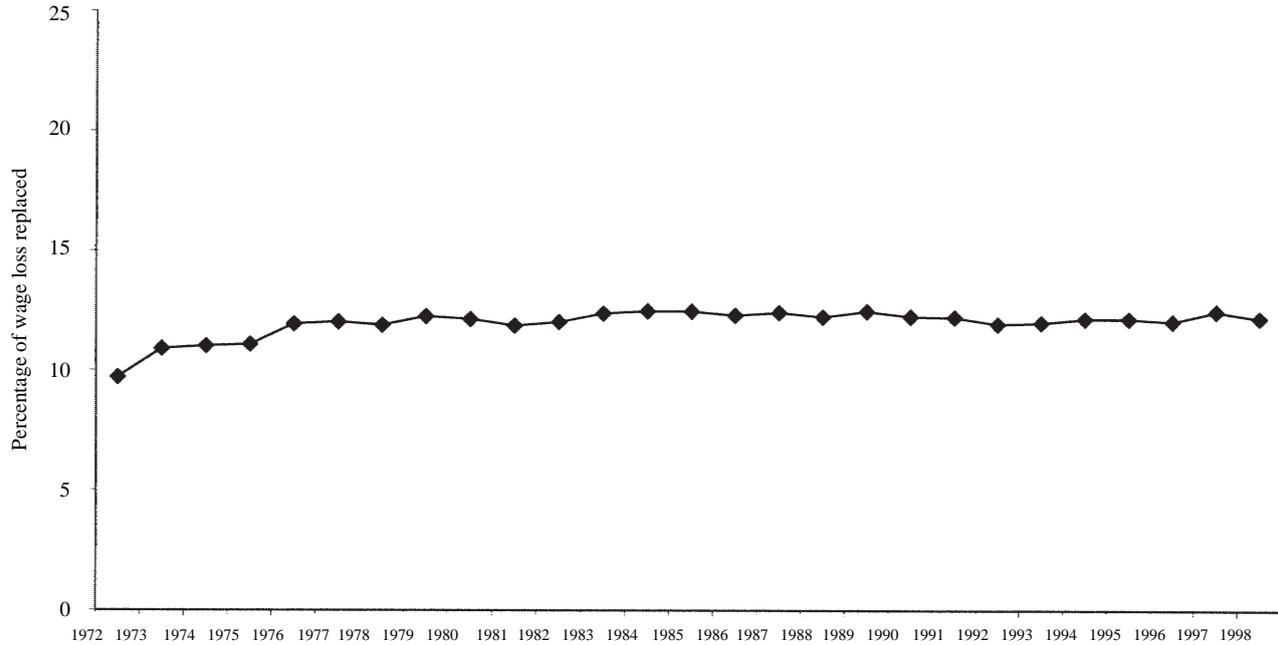
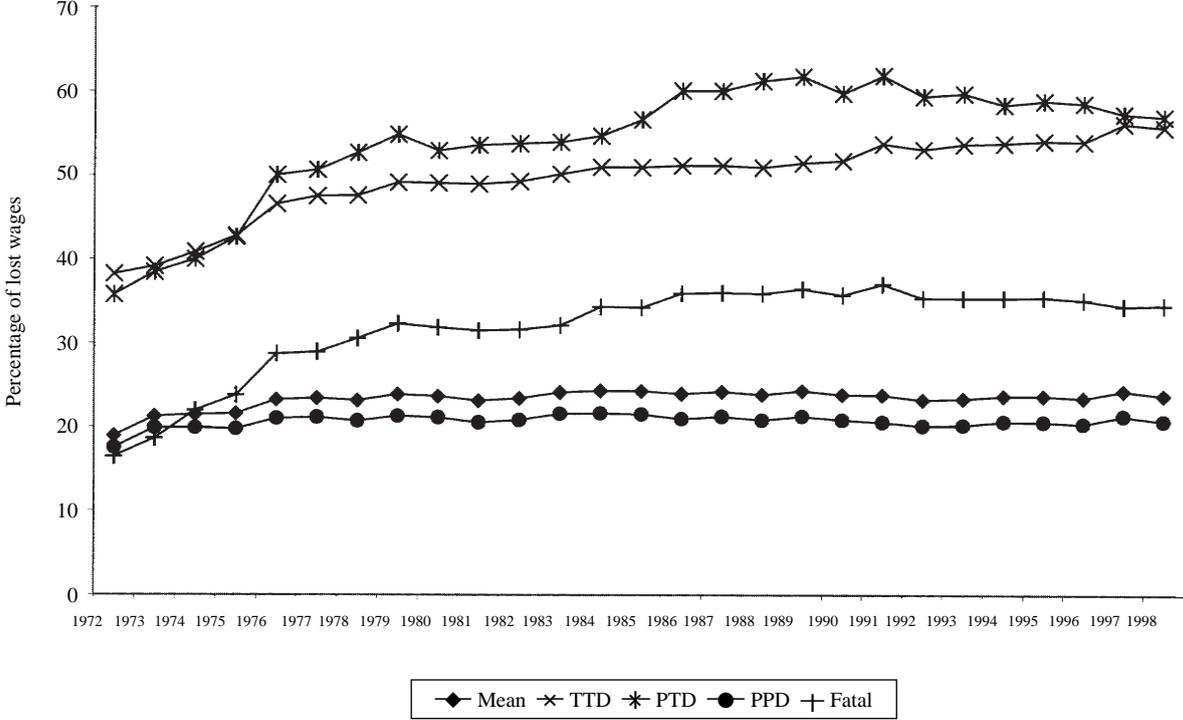
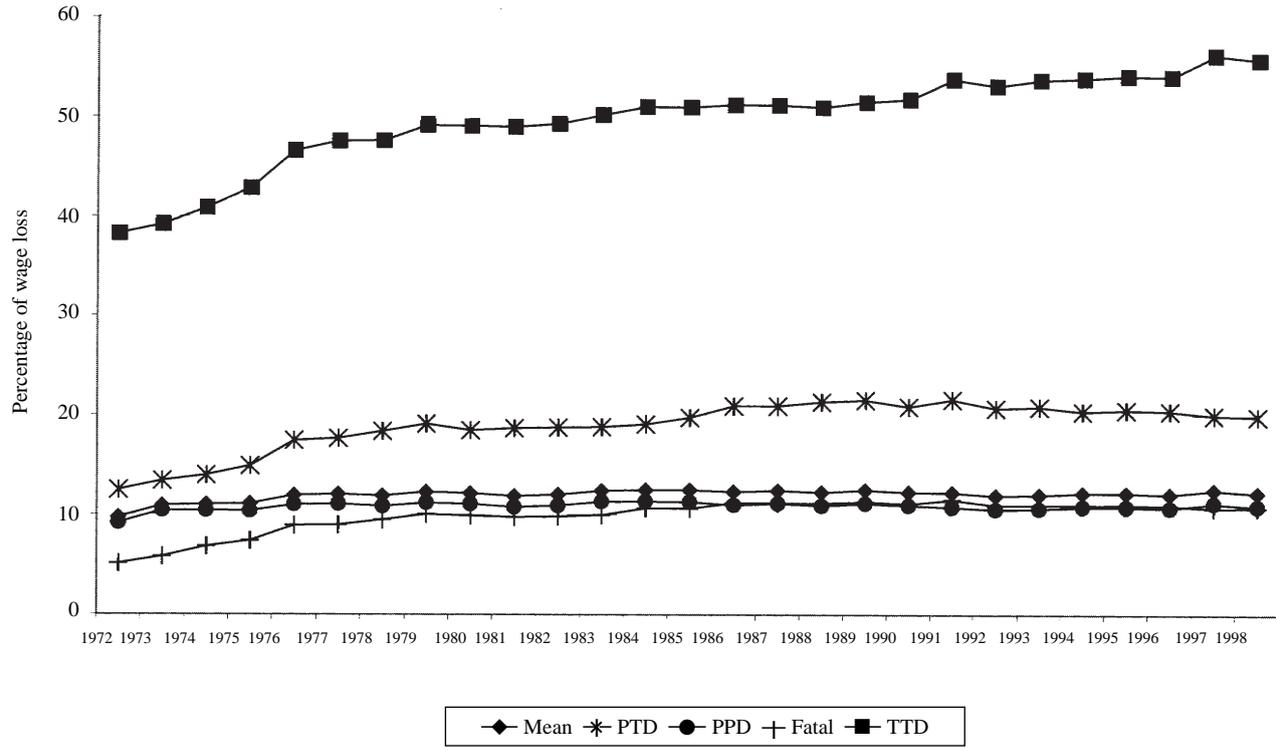


Figure 4.13 Simulated Replacement Rates, by Type of Benefit, 1972–1998



**Figure 4.14 Replacement Rates, Inflation-Adjusted Wage Loss, by Type of Benefit, 1972–1998**



claims in 1998. Figure 4.14 shows a similar result for TTD claims, where the wage losses are mostly short-term and about 55 percent are replaced by workers' compensation payments. However, the figure also indicates that other disability classes may receive 20 percent or less replacement of simulated lifetime earnings.

Thus, a comparison of these two figures indicates that the extent of wage replacement for different benefit types depends very significantly on assumptions about long-term wage loss. In addition, comparisons of the mean wage replacement rates with the PPD replacement rate indicate that benefits paid for PPD disability are, by far, the most significant determinant of overall benefit adequacy in this exercise. Further, the simulated replacement rate data in both figures reveal that the wage replacement performance of PPD benefits has been markedly lower than for other types of benefits.

However, we need to remember that the vast majority of workers' compensation claimants do not receive PPD benefits. Thus, the typical injured worker who recovers and returns to work without major difficulty (TTD) is securing the most adequate earnings replacement benefit. It is the permanent disabilities, and especially the permanent partial disabilities, that appear to fare the worst in this simulated wage replacement exercise. Moreover, there has never been any consensus about the *optimum* level of wage replacement for permanent partial disability, reflecting the inherent subjectivity of the measurement.

## CONCLUSIONS

In this chapter we reviewed the adequacy of wage replacement benefits in state workers' compensation programs using several different measures. We examined both social benefit adequacy and income replacement adequacy. Four major conclusions can be drawn from the analyses presented in this chapter. First, workers' compensation wage replacement benefits in most jurisdictions appear to be inadequate using the measures of social and income replacement adequacy employed here. Second, the choice of which measure to use in the evaluation of wage replacement benefit adequacy is critically important. While sim-

ple measures such as the TTD maximum are readily available, they provide very different assessments of benefit adequacy than do more complex—and more accurate—measures. Thus, they should be used very carefully, if at all.

Third, wage replacement rates appear to vary substantially by type of disability. TTD claimants appear to secure the most adequate wage replacement benefits, and PPD claimants the least adequate. This finding would not be surprising to experts in workers' compensation matters, as the many difficulties with compensation of PPDs are well known. It is also worth reminding ourselves that the majority of injured workers receive TTD benefits and return to work without permanent consequences.

Fourth, variation in PPD benefits accounts for most of the variation in overall benefit adequacy in these simulations. While this type of benefit is apparently less adequate than other benefit types, we should be cautious about this conclusion. Because PPD benefits are the most difficult and complex for workers' compensation systems, and because these claims are the most likely to result in compromise and release agreements (or other similar "settlements"), more confidence should perhaps be placed in the results for other benefit types.

The data reported in this chapter support the conclusion that the actuarial evaluation of statutory benefit parameters may be a useful means of benchmarking the adequacy of workers' compensation benefits, with some distinct advantages over alternative measures. Unlike empirical measures, it is possible to obtain "real-time" estimates of statutory benefits. Also, unlike data on actual benefits paid, these measures are not influenced by interstate differences in the composition of the workforce.

Assuming that actuarial assumptions about the extent and distribution of wage loss are correct, the statutory benefit measure provides a "quick and dirty" method of assessing changes in wage loss replacement adequacy. However, the statutory benefit index is not without its faults. Perhaps the most significant is that it fails to capture important differences in the application of state law to real claims that results in substantial differences between expected benefits and the benefits that injured workers actually receive. Actual benefits will be higher in states that administer the law in a way more favorable to claimants, while the opposite will be true for states with less liberal administration.

## Notes

1. See Thomason, Schmidle, and Burton (2001) for a full exposition of the paid benefits method. Thomason and Burton (2001) present the analysis of the Model Act (Revised).
2. It should be noted that there are members of this panel that have serious reservations about the methodology employed in the studies described in this chapter.
3. The poverty threshold delineates the point at which a family is officially considered to be poor. This threshold, which varies by family size and composition, but not by geographic location, was initially established in 1963–1964, revised in 1969 and 1981, but has been subsequently adjusted only to account for changes in the cost of living as measured by the CPI. For the purposes of this chapter, we have used the threshold that applies to a family of four.
4. This amounts to assuming that the shape of the wage distribution is similar in each state, even though the level of the average may differ.
5. We used the nominal replacement rate, minimum, and maximum in effect on January 1 during the year in question. We did not consider the effects of waiting and retroactive periods or the maximum duration of the TTD benefits for this set of calculations.
6. This amounts to assuming that the family status of all workers' compensation claimants was similar to that of fatal claims.
7. Social Security benefits are based on the claimant's wage history over a lengthy period rather than the weekly wage in the period shortly before disability. Because we lacked information on the long-term earnings history of workers' compensation claimants and how that history relates to our wage distribution, we assumed that the preinjury weekly wage accurately reflects current annual earnings, which, in turn, accurately reflects the claimant's wage history.
8. Of course, not all claimants will experience all four periods, depending on their age and family status.
9. A few states (e.g., New Mexico and Oregon) use formulae that incorporate additional factors such as the level of education, occupation, and age to determine lost earning capacity for a given functional impairment. In those states, we use CPS employment data and claims data from the New York State Workers' Compensation Board to determine the average lost earnings capacity for a given degree of functional impairment, which is then linked with the NCCI PPD distribution.
10. In many states, benefit payments to dependent children may continue while the child is enrolled in an educational institution after the age of majority, until a somewhat later age, typically age 21 or 22.
11. Annual wage growth was used to convert nominal benefit dollars to constant dollars.
12. The comparisons discussed in this section involve simulated (or assumed) wage loss rather than actual wage loss from administrative data, which are the basis for the analyses in Chapter 5.

# Appendix 4A

## Model Act (Revised) Assumptions

### Temporary Total Disability

#### Weekly Benefit

- Maximum = 200% of state average weekly wage (SAWW) lagged 3 years
- Minimum = 20% of SAWW lagged three years
- Replacement rate = two-thirds

#### Duration

- Waiting period = 3 days
- Retroactive period = 14 days
- No other limit on duration

### Permanent Total Disability

#### Weekly Benefit

- Same as TTD
- Indexed to change in SAWW

#### Duration

- No limit

### Permanent Partial Disability—Scheduled Injuries

#### Weekly Benefit

- Minimum and maximum identical to TTD
- Replacement rate = 55% of wage loss, except for scheduled injuries involving total loss or total loss of use of arm, hand, or leg, two-thirds of lost wage-earning capacity

#### Duration

- Determined by the following schedule:

<b>Injury type</b>	<b>Weeks</b>
Arm, above elbow	360
Arm, below elbow	324
Hand	324
Thumb, 1st phalange	65
Thumb, 2nd phalange	130
1st finger, 1st phalange	40.5
1st finger, 2nd phalange	81

2nd finger, 1st phalange	32.5
2nd finger, 2nd phalange	65
3rd finger, 1st phalange	16
3rd finger, 2nd phalange	32
4th finger, 1st phalange	8
4th finger, 2nd phalange	16
Leg, above knee	240
Leg, below knee	168
Foot	168
Great toe, 1st phalange	15
Great toe, 2nd phalange	30
Lesser toe, 2nd phalange	12
One ear	35.28
Two ears	208
Eye, enucleation	150
Eye, loss of vision	150

**Permanent Partial Disability—Unscheduled**

Weekly Benefit

- Maximums and minimums identical to TTD
- Replacement rate = two-thirds of lost wage-earning capacity

Duration

- No limit

**Fatalities**

Weekly Benefit

- Maximum = 200% of state average weekly wage (SAWW) lagged 3 years
- Minimum = 50% of SAWW lagged 3 years
- Replacement rate = two-thirds
- Offset by 100% of Social Security retirement benefits

Duration

- Cease upon remarriage
- Upon remarriage, claimant receives two years of benefits

# 5

## Wage Loss Studies

Research on workers' compensation benefit adequacy has been inhibited by the lack of adequate data. Determining exactly what an injured worker would have earned in the absence of the injury (the counterfactual case) is impossible. Therefore, making a determination as to the adequacy of the wage replacement afforded by workers' compensation programs is very challenging. As discussed in the previous chapters, it requires estimating what the injured worker's earnings would have been in the absence of the injury.

This chapter will examine the issue of the replacement of lost wages by workers' compensation programs empirically. We begin with a review of the rather limited literature available, including the studies that laid the foundation for what we have termed "modern wage loss studies." Then we will review recent empirical wage loss studies in some detail to determine what they reveal about the adequacy of wage replacement in workers' compensation programs.

### LITERATURE REVIEW

Some contributions to this research literature were not based on empirical studies of actual wage loss. The studies published by the Workers Compensation Research Institute (WCRI) are particularly noteworthy. In a pair of early publications, DeVol (1985, 1986) reviewed the adequacy and equity issues for short-term and long-term disability, respectively, using benefit formulae from different states. She also considered the potential impact of other income replacement programs on workers' compensation claimants. But these studies did not use actual earnings data from injured workers; they were benefit simulation models based on legislated benefit formulae and hypothetical earnings levels in different jurisdictions (similar to methods used in Chapter 4). She found that because of peculiarities in the benefit structures, some workers (many in some states) could receive more than 100

percent wage replacement, while others received considerably less. Careful examination of these inequities led the author to conclude that benefit replacement based on spendable earnings (i.e., after tax), rather than gross earnings, would provide greater equity (DeVol 1985, p. xiv).

Victor and Fleischman (1989) took this work a step further by incorporating the distribution of weekly wages, average duration of disability, marital status, spousal earnings, and other data for a sample of 16 states, focusing on temporary disabilities. While this study provides much more detail on specific benefit provisions (in fact, the subtitle is “a guide for policymakers”), it is still based on hypothetical claims and theoretical wage replacement rates rather than on actual empirical data. After consideration of the complex contributions of the statutory replacement rate, maximum and minimum benefits, dependent’s allowances, waiting and retroactive periods, and the statutory definition of the weekly wage, they also endorsed the concept of spendable earnings replacement as “a more equitable and efficient alternative” (p. 60).

While these simulation studies were valuable contributions to the literature and to our understanding of the issue of benefit adequacy, they did not really answer the persistent questions about wage replacement benefit adequacy. There are several reasons for this. First, and perhaps most important, these studies cannot adequately simulate the benefits paid in permanent partial disability (PPD) cases. In the vast majority of states, PPD benefits are paid based on physician evaluations and/or subjective factors that cannot be easily described by formula and that have unpredictable relationships to lost earnings. Since more than 60 percent of all workers’ compensation costs are allocated to the 30 percent of wage loss claims that involve PPDs, studies that cannot take them into account obviously provide only a partial description of the relationship between benefits and losses.

A second limitation of these studies is that they assume that all workers’ compensation recipients receive exactly the benefits to which they are entitled by statute (and that the amount of their entitlement is clear). In reality, we cannot be certain that the stream of benefits received coincides exactly with the workers’ compensation benefits specified by statute. There is also evidence that a significant number of injured workers do not file claims (Michaels 1998; Biddle et al. 1998; Morse et al. 1998; Pransky et al. 1999; and Morse, Dillon, and Warren 2000). Likewise, there is evidence that some paid claims do not reflect

true disability, in which case some would argue that any benefits paid are “in error.” Plus, as any workers’ compensation expert can tell you, there are many very complex and intricate rules and interpretations that govern benefit entitlement under our workers’ compensation systems. It would be delusional to assume that all these provisions can be adequately captured in a simple benefit simulation study.

In his National Commission on State Workmen’s Compensation Laws discussion of the difficulty in dealing with the counterfactual (noninjured) alternative that is needed to assess the degree of wage loss, Berkowitz (1973) identified the following list of intervening factors: “probabilities of death, unemployment, illness, continued tenure in the occupation, future productivity in the occupation and future tax liabilities” (p. 190). Further, he pointed out “the only feasible measure for many of these items is one based on an estimate made for a group of workers with presumably comparable characteristics” (p. 190). This statement from nearly 30 years ago remains true today; but now, thanks to the availability of more adequate administrative data and the computing power to analyze them, it is possible to actually implement an empirical research strategy to answer these questions more definitively.

Berkowitz and Burton (1987) provided the earliest empirical analysis of the issue of benefit adequacy in a study conducted for the National Science Foundation in the 1970s and ultimately published by the Upjohn Institute. They reviewed the widely varying procedures for compensating permanent disabilities in 10 states, and collected actual empirical data on wages earned before injury and workers’ compensation benefits subsequently paid to permanent disability claimants in three states: California, Florida, and Wisconsin. They were able to gather data on earnings for two years before the work-related injuries (all of which occurred in 1968) and for five to six years following injury (1968–1973) through the cooperation of the Social Security Administration.

Berkowitz and Burton used a comparison group of workers, also injured in 1968 but who received less than a 5 percent permanent disability rating in California, to estimate the wages that the more seriously injured workers would have earned if they had not been injured. “Expected growth ratios” for future wages were calculated by age, gender, and earnings level for the California sample (which was the only one with earnings data) and applied to workers with similar characteris-

tics in the other states. A major complication of the study was the level of litigation in some workers' compensation jurisdictions. As a result, Berkowitz and Burton reported their estimates separately for uncontested and contested permanent disability cases in each state.

The empirical findings were somewhat surprising and very different in each state. In Wisconsin, Berkowitz and Burton estimated that workers' compensation benefits replaced 85 percent of earnings losses for uncontested PPD cases and 58 percent for contested cases (pp. 329–330). In Florida, they found that the workers' compensation system, on average, replaced 724 percent of earnings losses for uncontested permanent partial cases (!) and 51 percent for contested cases (p. 339). In California, workers in uncontested permanent partial cases were judged to have suffered no earnings losses, and thus their wage replacement rate was infinite.<sup>1</sup> Workers in contested permanent partial cases in California achieved wage replacement of 41 percent of their earnings losses (p. 353).

The overall wage replacement rate was 75 percent for Wisconsin claimants, 59 percent for Florida, and 46 percent for California (p. 357).<sup>2</sup> Thus, by our standard of two-thirds gross wage replacement, benefits for PPD claimants were adequate in Wisconsin, but inadequate in Florida and California. The authors also called attention to the very high degree of variability in replacement rates by worker's age and by the part of body injured. Such results obviously give rise to questions about the equity of workers' compensation benefits, in addition to their overall adequacy.

Johnson, Cullinan, and Curington (1978) completed another empirical study of workers' compensation benefit adequacy. They collected original interview data from nearly 2,000 workers' compensation beneficiaries with severe permanent impairments in California, Florida, New York, Washington, and Wisconsin. They adopted the following measure of adequacy:

- 1) the extent to which impaired workers, who suffer a loss of wage income, receive WC benefits, and
- 2) the extent to which those who receive benefits are compensated for losses of wage income (p. 96).

Because they were studying workers with severe permanent impairments, the wage losses observed five to seven years after injury were

considerable. The average wage loss in 1975 was \$5,842 (or \$19,982 in 2003 dollars), and nearly three-fourths of their sample was still suffering wage loss of at least \$500 per year (or \$1,710 in 2003 dollars) at the time of the survey. They found that about 26 percent of the injured workers in the sample were no longer receiving any workers' compensation benefits. Moreover, they found that among those who were still receiving benefits, only about 12 percent of the current wage loss was being replaced five to seven years following injury. Overall, they estimated about a 10 percent wage replacement rate for severely impaired workers' compensation claimants in five states (California, Florida, New York, Washington, and Wisconsin) over the five years following serious injury.

The California Workers' Compensation Institute (CWCI) sponsored an empirical study of benefit adequacy in California in the early 1980s, which concluded that "income benefits provided by the California law are both inadequate and inequitable" (CWCI 1984, p. 1). From a sampling frame of 8,364 serious workers' compensation claims incurred between July 1, 1975, and June 30, 1976, in California, an independent survey firm conducted 1,076 interviews (32 percent response rate) with a sample of injured workers some six to seven years following their original injuries.

The study found that the California workers' compensation program was replacing, on average, only 49 percent of the net earnings lost by permanently disabled workers over their working lives. Perhaps more troubling was that those workers with the least severe injuries received the most adequate replacement rates, exceeding 80 percent on average for those with 1 to 9 percent disability ratings. The only exception to this general finding was for the permanently and totally disabled, whose wage replacement rate was 67 percent, exactly as specified by statute.<sup>3</sup>

These studies raised serious questions about the adequacy of workers' compensation benefits. A great deal more research attention has been devoted to this issue recently; in particular, three independent benefit adequacy studies in California, Washington, and Wisconsin. More recently, the three principal authors of these studies conducted a study of New Mexico workers' compensation losses and benefits. They used identical methods and definitions to compare benefit adequacy in these states plus Oregon. Further, they reanalyzed their data to present com-

parable analysis of wage replacement in all five states for PPDs. We turn now to a detailed review of these “modern wage loss studies.”

## **MODERN WAGE LOSS STUDIES**

Studies from several different states exploring the adequacy of workers’ compensation benefits have been published in the past few years. Several studies of the California workers’ compensation system were sponsored by the California Commission on Health and Safety and Workers’ Compensation and conducted at RAND by a team headed by Robert Reville (see Peterson et al. 1998; Reville 1999; and Reville, Polich, et al. 2001). They first studied the adequacy of permanent partial disability (PPD) benefits received by injured workers at insured firms in California. A later study extended the effort to employees of self-insured firms.

Boden and Galizzi (1998, 1999) studied workers’ compensation benefits in Wisconsin, focusing on measuring earnings losses of injured workers, quantifying the effects of various characteristics on injured workers’ losses, and determining the extent of wage replacement by workers’ compensation benefits. Biddle (1998) explored the amount of workers’ compensation benefits received by workers with different characteristics in the state of Washington as part of a larger system performance audit requested by the Washington state legislature. Both the Washington and Wisconsin studies estimated losses for the full range of injured workers, while the California studies included only workers with PPD benefits.

Most recently, Reville, Boden, et al. (2001) conducted a study for the New Mexico Workers’ Compensation Administration, which included a comparison between PPD benefits in California, New Mexico, Oregon, Washington, and Wisconsin. While only covering PPDs, this is the broadest comparative analysis across jurisdictions conducted thus far. We will use these comparative results in the following discussion.

### **Earnings Loss**

As discussed earlier, the ideal measure of lost wages is the difference between a worker’s actual postinjury wages and the wages that

would have been earned had the injury not occurred. Our measure of wage replacement adequacy is the ratio of wage replacement benefits paid to those lost wages. Uninjured wages (the counterfactual) are not observed but must be estimated. Generally, wage loss studies in the past have used preinjury wages to represent the wages that would have been earned had an injury not occurred. This may be acceptable in the short run, but it does not account for promotions or other job changes, raises, spells of unemployment or ill health, and various market and economic trends that occur in the long run. To ensure that these factors are included in the estimation, all of the authors of the modern wage loss studies compare injured workers to a group of uninjured workers, or a group of less seriously injured workers, that have similar characteristics to those injured workers whose benefit adequacy is being assessed.

Reville (1999) matched each injured worker to between 1 and 10 uninjured workers. These uninjured workers were employed at the same firm as the injured worker, and they had similar preinjury wages.<sup>4</sup> Unfortunately, demographic characteristics such as age, gender, education, and job tenure were not available in California to make the matches more precise.

A different method to estimate losses was used by Boden and Galizzi and by Biddle, who also used somewhat different comparison groups. Their method involved using multiple regression analysis to estimate the profile of earnings over time (before and after the injury). Biddle's comparison group consists of Washington workers' compensation claimants with medical-only claims (i.e., no compensable wage loss). If 3 work days or less were missed due to injury or illness (Washington has a 3-day waiting period for workers' compensation benefits), it was assumed that the claim had no measurable long-term effect on labor market experience. Boden and Galizzi used Wisconsin workers with 8 to 10 days of lost time as the comparison group, assuming that this group's losses were confined to their short-term period off work, i.e., with no long-term consequences for earnings.

The regression approach allowed these researchers to take into account the average impact of the characteristics of the workers, their employers, and their injuries. This statistical technique is similar in concept to matching the comparison group to the injured workers on those characteristics available to the researchers. However, when it is possible to control for additional characteristics, the effect of the injury on

earnings can be more accurately estimated with regression techniques, and it does not depend on finding an uninjured worker with similar earnings at the same firm.

To a great extent, differences in the choice of method and of comparison group are driven by necessity. At the time of the original RAND study (Peterson et al. 1998), they did not have access to data on workers with medical-only or short-term injuries. However, they were able to obtain wage and employer information on uninjured workers at the firms that employed the injured workers. In most firms, especially larger firms, there were adequate numbers of uninjured workers to match by firm and earnings level, so RAND elected to use a matching method. Furthermore, since they lacked personal information about the uninjured workers, they could not have matched on additional characteristics, nor did they have the option to use regression methods to take worker characteristics into account.

In Washington (Biddle 1998) and Wisconsin (Boden and Galizzi 1999), the researchers only had access to information about injured workers when they did their studies. Without the use of uninjured workers as a comparison group, they therefore chose to use workers with minor injuries and hoped for only short-term consequences. Biddle's Washington workers' compensation dataset allowed him to use cases with less than four days of lost time (i.e., within the waiting period), but Boden and Galizzi's Wisconsin data did not include such cases. Also, because the comparison group was workers with short-term injuries, there were not enough cases at each firm to do within-firm matching, so they used a regression methodology.

Given our purpose of assessing the adequacy of wage replacement benefits, the earnings of comparison group members must behave very much like the earnings of injured workers had they not been injured. Matching methods attempt to satisfy this condition by matching on observed characteristics. Regression methods attempt to do this by conditioning regression estimates on observed characteristics.

In both cases, there is a straightforward test that will rule out inappropriate or misleading comparison groups. For the matched comparison group, one looks to see if there are differences between the preinjury earnings of the controls and the injured workers. For the regression studies, one looks to see if the regression-adjusted path of preinjury earnings differs between the two. In the studies reported here, there

were no significant differences found in the preinjury path of earnings between the two groups.<sup>5</sup>

## Data

The data used in the California study were collected by the Workers' Compensation Insurance Rating Bureau and matched to employment and earnings data from the State of California Employment Development Department. Employees' PPD claims from 1991 to 1993 at firms covered by workers' compensation insurance were used in the analysis. Workers with multiple claims during the observed period and those whose Social Security numbers were associated with three or more names were excluded from the sample. Quarterly earnings data were available from the fourth quarter of 1989 through the second quarter of 1996. Therefore, from three to five years of postinjury wages could be examined. The sample includes 29,322 PPD claimants that were matched to a total of 102,526 noninjured controls.

The Washington data on workers' compensation were provided by the Washington Department of Labor and Industries. Workers aged 16–70 who were originally injured between July 1993 and June 1994 were included in the sample. Earnings data from the Washington Employment Security Department were matched to the claimant data, resulting in 45,532 valid compensable claims and 11,875 medical-only claims used to form the comparison group. Third-party liability cases, workers who also received Social Security disability benefits, those who received permanent total disability awards, or who had more than one additional claim in the three years following their initial claim were excluded from the analysis.

The Wisconsin data used by Boden and Galizzi (1999) came from the Workers' Compensation Division and the Unemployment Compensation Division of the Wisconsin Department of Workforce Development. Injuries reported from April 1, 1989, to September 30, 1990, involving workers who lost more than seven days of work were included. Quarterly wages were available for at least 1.5 years before the injury and up to five years after the injury. A sample of 54,309 injured workers who lost at least eight days of work was used for the analysis. Permanent total disability beneficiaries, workers receiving a compromise settlement resulting from more than one injury, and

workers whose injuries resulted in death were excluded from the sample.

New Mexico data were assembled by the New Mexico Workers' Compensation Administration, in cooperation with the New Mexico Department of Labor. The analysis included claims with injury dates from 1994 through 1998. Quarterly earnings data were available from the second quarter of 1993 through the third quarter of 1999. A total of nearly 120,000 claims were available, of which 96 percent could be matched to earnings data. Of these, 7,543 were permanent partial claims, and another 287 involved lump-sum compromise settlements, which were assumed to be PPD claims. Eighty-two percent of these claims were successfully matched to 1 to 5 uninjured (control) workers at the same establishment. The method was very similar to the original RAND study.

### **Methodological Issues**

None of the data sources can fully explain the observation of zero wages in a given quarter. A lack of reported earnings may result from leaving covered employment or the specific state being sampled (administrative database), leaving the workforce for personal reasons such as retirement or unemployment, or missing work because of an injury. The studies used different methods for accommodating this lack of information.

Two methods were used in the original RAND report (Peterson et al. 1998) to estimate wages lost due to injury in California. The "minimum" method assumes that only the period of zero or missing (unreported) wages immediately following the injury is actually lost earnings due to the injury. Other periods of zero reported wages are regarded as unrelated to the injury and are ignored in the analysis. This would include instances of missing wages caused by moving out of state, leaving covered employment, or leaving the workforce altogether. The "maximum" method assumes that all periods with no reported wages after the injury date are injury related. Thus, the minimum method forms a lower bound on wage loss caused by the injury while the maximum method provides an upper bound in the California study. Of course, neither of these approaches can address the possibility that some of the observed wage losses are the result of injured workers pro-

longing their absence from work beyond the point where they are actually able to return to employment.

Biddle (1998) first includes all zero earning periods when calculating wages lost. Thus, as in RAND's maximum method, all differences between the injured worker's wages and the control group's wages are assigned to injury alone. In the second method, parallel to RAND's minimum method, Biddle excludes all zeros as unrelated to the injury. This assumes that departures from the labor force, moving out of state, and moving into uncovered employment are not due to the work-related injury. The Wisconsin study (Boden and Galizzi 1999) utilizes the maximum method.

The Washington and Wisconsin studies both include descriptions of the models that were created to predict how much injured workers would have earned in the absence of injury. These two studies use essentially the same statistical specification to estimate postinjury earnings. The model consists of two primary elements. One of these elements represents the components of earnings that are unaffected by injury, while the other represents the impact of injury on earnings.

Combining both sets, the Washington and Wisconsin studies develop a final earnings estimation model which includes variables such as age, job tenure, industry and occupation, type of firm, employer size, stability of preinjury earnings, and frequency of employer change before the injury. Their analysis takes into account multiple claims of workplace injury over the observed period. The models also include a variable that gives the wage loss effect of a second injury.

Two analytical methods, which produce similar results, are used to estimate Boden and Galizzi's model. The first method uses the change between two periods (i.e., first differences) and is not affected by unmeasured, but unchanging, differences between workers (e.g., motivation). The second method uses a repeated-measures model allowing for first-order autocorrelation of errors. Biddle relies on fixed-effects estimates.

## Results

Although the data used in the studies are similar in each of the states, the authors' approaches to analyzing the data differ. Among the differences are that only PPD claimants are considered in the California

studies. Benefits received by PPD claimants might include TTD benefits and vocational rehabilitation maintenance (VRMA) allowance as well as PPD benefits. Unlike the other authors, Reville does not break the analysis down into different severity groups. Instead, he presents results by the number of years of postinjury data observed (3, 4, or 5) and by the year of injury (1991, 1992, 1993, or 1994).<sup>6</sup> Results are stated in pre-tax 1997 dollars for wage replacement calculations using both the maximum and minimum methods described above.

Biddle (1998) presents 3.5 years of estimated lost earnings after the injury, and reports replacement rates in both pre-tax and after-tax terms using constant 1994 dollars. He analyzes six different worker groups based on severity of injury. To quantify severity, Biddle uses time lost from work, in days: 14 or fewer, 15–30, 31–60, 61–180, more than 180, and individuals receiving PPD awards.

Boden and Galizzi (1999) report their findings in 1994 after-tax dollars for men and women separately. Injured workers are classified into 11 severity groups measured by time lost and benefits received. This includes the comparison group of workers who missed 8 to 10 days of work due to injury. Other groups include workers who lost 11 days to 2 weeks, 2–3 weeks, 3–4 weeks, 4–6 weeks, 6–8 weeks, 8–12 weeks, 12–16 weeks, more than 16 weeks, individuals who receive PPD benefits, and those who receive compromise settlements. The authors present postinjury earnings data for both the observed period of five years (or less) and for the full projected working lifetime of the workers.

Because of these differences, the comparability of the studies is unclear, and we therefore present them separately. After we review these separate results, we will examine the New Mexico comparative study of PPD claims, where all states were treated as alike as possible.

### **California Results**

In the California system, benefits are often distributed in lump-sum payments. Reville (1999) allocates these payments over the observed period. However, total benefits paid out to workers with larger disability ratings are understated because weekly benefits may still be received after this time period. Table 5.1 shows that injured workers earn at least \$14,250 less than comparison workers when considering three years of

**Table 5.1 Cumulative Wage Losses and Replacement Rates for California PPD Claimants, 1991–1993**

Year of injury	Years from injury	Minimum method		Maximum method	
		Cumulative wage loss (\$)	Replacement rate (%)	Only quarters with injured and control working	
				Cumulative wage loss (\$)	Replacement rate (%)
1991	5	23,692	48	46,677	38
1991–92	4	20,844	54	37,829	42
1991–93	3	15,939	67	29,201	50
1991	5	23,692	48	46,677	38
1991	4	21,705	51	38,743	41
1991	3	18,182	58	31,960	46
1992	4	19,121	60	36,016	45
1992	3	14,761	74	27,122	54
1993	3	14,258	73	27,990	53

NOTE: The minimum method assumes that only the period of zero or missing wages immediately following the injury is attributable to the injury. The maximum method assumes that any wage loss during the entire period of observation is attributable to the injury. The truth lies somewhere in between.

SOURCE: Adapted from Reville (1999).

postinjury data by the minimum method. These claimants have pre-tax wage replacement rates of 58 to 74 percent, depending on their year of injuries. As mentioned earlier, the recession of 1991 seems to have depressed the wage replacement rate through a significant labor market impact. Lost wages increase by almost \$5,000 when four years are considered instead of three, so losses obviously are continuing. Another \$3,000 is lost when a fifth year of postinjury experience is included in the analysis, resulting in \$23,692 lost wages over five years and a replacement rate of 48 percent on average.

For injuries in 1992 and 1993, the California results show three-year replacement rates of more than 73 percent. However, as Table 5.1 shows, the replacement rates drop with each passing year as the lump-

sum payments are spread over a longer period of time. Thus, for 1991 injuries, the wage replacement rate drops from 58 percent at three years, to 51 percent at four years, and to 48 percent at five years. This indicates that the length of the observed period after the injury may be critical to assessing wage replacement benefit adequacy.

In addition, cumulative wage loss approximately doubles when all periods of zero reported wages are included in the analysis as work injury related, i.e., as calculated by the maximum method. An examination of five years of postinjury data reveals that workers' compensation claimants earn \$46,677 less than the controls and have a pre-tax wage replacement rate of 38 percent. Table 5.1 summarizes these results.

Considering the mean quarterly wages and benefits for injured workers and controls, it seems clear that "adequate" replacement of lost earnings is concentrated in the period immediately following the injury, as was reported by Berkowitz and Burton (1987) for California workers injured in 1968. Thus, California workers' compensation benefits do appear to compensate for much of the initial lost earnings associated with disability. However, the fraction of lost earnings replaced declines as the duration of disability increases.

Reville (1999) attempts to further extrapolate from the observed wage trends to simulate 10 years of wage loss after the injury. It is assumed that the recovery occurs after the last observable year and no deterioration in earnings resulting from the work injury occurs thereafter. As would be expected, extending the time horizon to 10 years results in a significant increase in lost earnings. The replacement rate falls to 29 percent in the minimum method and 25 percent in the maximum method.

### **Washington Results**

Biddle (1998) first examines the wages of the injured workers. He finds that there is a significant drop in earnings in the quarter of the injury for all workers who have a time loss of 15 or more days, whether the zero wage observations are included in the analysis or not. The difference between injured worker's average earnings and the comparison group's average earnings decreases as time progresses. However, some wage loss persists throughout the 3.5 years that workers were followed after the injury.

Looking at the wage replacement rate of the injured workers, Biddle finds a positive relationship with severity of condition (as indicated by lost time). In Washington, those with greater lost time have higher replacement rates than the less severely injured (see Table 5.2). Workers missing more than 180 days due to an injury have a pre-tax replacement rate of 73 percent for men and 54 percent for women. The least severely injured (less than 15 days lost time) receive pre-tax replacement rates of 9 percent and 8 percent for men and women, respectively.

This difference results partly from the fact that only 3.5 years of postinjury data are considered for the severely injured. The more severely injured workers will likely have uncompensated losses that extend well beyond that period, as seen in California. In Washington, as in many other jurisdictions, PPD awards typically are given in a lump sum after injury, even though wage loss can last for an extended period. This results in a very high apparent replacement rate when compared to the limited period (3.5 years) of postinjury lost wages, but one which might be considerably lower if the full magnitude of future wage loss were known. So Biddle projects an additional 10 years of earnings losses to get a better idea of the true replacement rate for PPD claimants. He finds only a 34 percent wage replacement rate after doing this, much lower than the 97 to 100 percent indicated in Table 5.2.

**Table 5.2 Earnings Loss and Replacement Rates, by Injury Category, for Washington Workers**

Injury category (days)	Average pretax wage loss (\$)		Replacement rate (%)	
	Men	Women	Men	Women
Less than 15	2,990	3,780	9	8
15–30	5,051	5,136	19	15
31–60	8,671	6,582	21	23
61–180	12,446	12,481	37	27
More than 180	33,915	29,505	73	54
PPD awards	16,270	13,259	97	100

NOTE: Both wage losses and benefits are observed for 3.5 years following the injury or illness.

SOURCE: Adapted from Biddle (1998).

Next, Biddle investigates whether wage losses are concentrated among a few workers in a group or whether they are spread more widely throughout the group. He looks at the percentage of injured workers (by severity group) who were earning at least 95 percent of their (six-quarter) preinjury average wage. Attempting to isolate injury-related loss in earnings, he finds that significant wage loss is a problem experienced by a relatively small minority of workers' compensation claimants. For injured workers with 15- to 60-day time loss due to injury, generally TTD cases, about 25 percent experience a significant loss of wages following the injury. One year after the injury, about 10 percent are still experiencing a significant earnings loss.

Biddle also investigates the average wages lost and replacement rates across different demographic and economic groups. These results are confirmed through regression analysis. He finds that injured workers with dependents receive more in benefits and thus, have higher replacement rates than those without dependents. Earnings losses are significantly higher for married females than for either married or unmarried males when other factors are held constant, presumably reflecting some postinjury voluntary withdrawal from the labor force. Workers under age 26, workers who suffer head injuries, and workers with low incomes before injury all experience substantially higher wage losses than other workers.

### **Wisconsin Results**

Boden and Galizzi (1999) calculate an overall pre-tax replacement rate of 63 percent for men and 62 percent for women in Wisconsin when considering the observed four to five years of postinjury earnings data.<sup>7</sup> TTD beneficiaries with shorter lost time durations due to injury have higher replacement rates than those with longer durations (more than 6 weeks). Workers who receive TTD benefits for a longer period of time (12 weeks or more for men, and 16 weeks or more for women) and do not receive PPD benefits have greater average losses than those who receive PPD benefits and do not receive settlements. Men and women have comparable average observed losses, but women lose a higher proportion of their preinjury earnings (see Table 5.3).

The findings for PPD benefit adequacy suffer from the same flaw as the Washington results. Because the time of observation after the injury

**Table 5.3 Wisconsin Average Losses and Replacement Rates by Benefit Category, 1989–1990 Injuries**

Benefit category	Observed period				Projected 10 years			
	Mean after-tax loss estimates (\$)		Total benefits as a percent of pretax losses (%)		Mean after-tax loss estimates (\$)		Total benefits as a percent of pretax losses (%)	
	Men	Women	Men	Women	Men	Women	Men	Women
TTD benefits only								
4–7 days	263	189	32	34	263	189	32	34
8–10 days	377	252	62	63	377	252	62	63
11–14 days	567	464	59	51	567	464	59	51
2.1–3 weeks	844	478	58	71	844	478	58	71
3.1–4 weeks	1,293	819	55	60	1,293	819	55	60
4.1–6 weeks	1,516	1,037	65	64	1,516	1,037	65	64
6.1–8 weeks	4,632	3,409	27	28	4,632	3,409	27	28
8.1–12 weeks	6,183	5,472	34	29	7,876	9,771	24	15
12.1–16 weeks	11,067	8,654	29	28	20,021	15,305	15	14
16.1 + weeks	17,434	11,365	41	40	25,313	16,078	26	25
PPD benefits	10,431	9,702	86	83	14,022	15,565	57	46
Compromise benefits	28,597	20,970	87	67	47,406	38,488	47	42
All claims	4,156	3,616	63	62	6,203	5,964	45	37

SOURCE: Adapted from Boden and Galizzi (1999).

is restricted, it is likely that wage losses are continuing beyond that point. To the extent that lump-sum payments or other front-loaded compensation is included, wage replacement benefit adequacy will be overstated.

Rather different results are found when an extended period of postinjury earnings is projected.<sup>8</sup> Injured workers with more time lost from work (presumably but not necessarily more serious injuries) and PPD beneficiaries suffer the greatest projected losses. Although only one-fourth of all injured workers in Wisconsin receive either TTD benefits for more than 16 weeks, PPD benefits, or compromise settlements, these beneficiaries suffer three-fourths of all lost earnings.

The average projected losses incurred by women are larger than the average losses for men. On average, men with more than seven days lost time due to a work injury will lose the equivalent of about 6 months of earnings over their lifetime, while women will lose about 10 months. Considering projected losses, replacement rates decline considerably after TTD benefit duration of 6 weeks. On average, in Wisconsin men receive wage replacement benefits of 45 percent and women receive 37 percent of the pre-tax wages they likely would have earned in the 10 years following their work injury.

### **Comparative Analysis for PPD Claims**

In a joint NASI/Upjohn Institute published volume, the three primary authors of these state-specific studies presented comparable estimates of the losses suffered and workers' compensation benefits received for PPD claimants in the three states (see Biddle, Boden, and Reville 2001). These comparisons were further extended by the RAND volume on the New Mexico permanent partial study, which extends the comparison to five states: California, New Mexico, Oregon, Washington, and Wisconsin (see Reville, Boden, et al. 2001).

While this analysis of PPD benefit adequacy is not as broad as the earlier ones (at least for Washington and Wisconsin), it does cover a very interesting workers' compensation subpopulation that accounts for a major share of total workers' compensation costs and administrative complexity, even though it is a minority of claimants in the system. In addition, the same matching method was used in each state, thereby minimizing the impact of the differences in methodology among the studies discussed earlier.

All paid workers' compensation indemnity benefits are used for this analysis, including temporary and permanent disability benefits (with lump sums), cash settlements for future medical benefits (California and Wisconsin only), and vocational rehabilitation maintenance allowance. Earnings losses are forecast beyond the observed period following injury by projecting the final observed year wage losses forward for a total of 10 years following the injury and discounting the results back to the point of observation. It should be noted that workers' attorney fees and medical/legal costs have not been deducted from the gross benefits paid, nor have any lost nonwage benefits been counted as economic losses.

Table 5.4 reports the estimated 10-year wage losses, the potential 10-year earnings, and total indemnity benefits paid for PPD claimants. The proportional 10-year wage loss and pre-tax wage replacement rates are also given. Given differences among the states in the method of compensating PPD cases, it is not surprising that the replacement rates for 10-year losses are quite different.<sup>9</sup> Pre-tax replacement rates range from 29 percent in Wisconsin to 46 percent in New Mexico (see Biddle, Boden, and Reville 2001 for details). However, it seems clear that, for this group of states, PPD wage loss replacement falls far short of the two-thirds of pre-tax income we have adopted as our standard of adequacy.<sup>10</sup>

**Table 5.4 Ten-Year Earnings Losses and Replacement Rates for PPD Claimants**

	New Mexico	Washington	California	Wisconsin	Oregon
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 (%)	20	16	25	23	20
Pretax replacement rate (%)	46	41	37	29	42

SOURCE: Reville, Boden, et al. (2001, p. 50).

## Differences by Insurance and Earnings Status

The second RAND study offers insight into two additional benefit adequacy issues, the nature of the workers' compensation insurance coverage (insured or self-insured), and the level of earnings of the injured worker. Both are important policy variables that may bear on the question of benefit adequacy.

Some believe that there is a significant difference in the way that workers' compensation programs are administered between insured and self-insured employers. Because self-insured employers are generally larger employers, and because the relationship with the injured employee is usually more direct (although many self-insured employers use third-party administrators), there is more opportunity for variation in the administration of workers' compensation by self-insured employers.

Table 5.5 examines earnings losses and replacement rates for PPD cases separately for self-insured and insured firms in California. Indemnity (wage loss) payments are fairly similar in the two sectors, differing by only about \$1,500 (less than 9 percent). Earnings losses are about 19 percent greater in self-insured firms, reflecting their higher wage levels. However, the five-year earnings replacement rate differs

**Table 5.5 Earnings Loss and Replacement Rates for PPD Claimants, Self-Insured and Insured Firms, 1993 Injuries**

	5-year pretax earnings
<b>Self-insured firms</b>	
Earnings losses (\$)	39,500
Potential uninjured earnings (\$)	168,900
Total indemnity (\$)	19,100
Replacement rate (%)	48
<b>Insured firms</b>	
Earnings losses (\$)	33,200
Potential uninjured earnings (\$)	103,500
Total indemnity (\$)	17,600
Replacement rate (%)	53

SOURCE: Reville, Polich, et al. (2001).

by only 5 percent. This difference results from varying patterns of return to work in the two sectors (see Reville, Polich, et al. 2001).

Given maximum benefit caps, the earnings level of the injured worker has obvious implications for wage replacement adequacy. As discussed earlier, if benefits are capped at the state average weekly wage, the gross wage replacement rate will be below two-thirds for a sizeable number of workers. However, it must be kept in mind that the wage distribution for injured workers may be different than the wage distribution for the entire working population. There are several studies that suggest that a disproportionate share of work injuries occur among low-wage earners. Table 5.6 shows that wage replacement rates for California workers injured in 1993 that received PPD compensation varied considerably by preinjury earnings level.

Results are shown separately for self-insured and insured employers and are organized by earnings quartile within each group. Thus, among employees of self-insured workers, the bottom quartile of injured workers (in terms of preinjury earnings), which included annual

**Table 5.6 Earnings Losses and Replacement Rates by Preinjury Earnings Percentile for PPD Claimants, Self-Insured, and Insured California Employers, 1993 Injuries**

Annual salary (\$)	5-year earnings losses (\$)	5-year potential uninjured earnings (\$)	Indemnity paid by year 5 (\$)	Replacement rates (%)
				5-year Pretax
<b>Self-insured firms</b>				
Up to 23,000	31,170	81,136	18,121	58
23,000–34,000	36,715	130,828	20,348	55
34,000–48,000	39,751	188,722	19,312	49
48,000+	50,481	274,841	18,522	37
<b>Insured firms</b>				
Up to 13,000	16,278	49,473	14,703	90
13,000–21,000	24,818	71,098	16,801	68
21,000–32,000	38,382	109,466	19,019	50
32,000+	53,146	183,745	19,889	37

SOURCE: Reville, Polich, et al. (2001).

earnings up to \$23,000, received 58 percent replacement of their pre-tax lost earnings for the five years following the injury. The top quartile (with annual earnings over \$48,000) received only 37 percent replacement.

Similarly for injured workers at insured employers in California, the bottom quartile (with annual earnings up to \$13,000) received 90 percent gross replacement of lost earnings, while the top quartile (earnings over \$32,000) received only 37 percent replacement. This primarily reflects the influence of the benefit minimums and maximums, which affect income replacement rates for lower- and higher-paid workers respectively. Reville et al. observe, “. . . the injured workers who fare best in the California system are the lowest-paid workers at insured firms. Those with the lowest replacement rates are the highest-paid workers at both self-insured and insured firms” (Reville, Polich, et al. 2001, p. xxiii).

## CONCLUSIONS

It seems clear that these modern wage loss studies provide better estimates of lost earnings and wage replacement rates for injured workers. Since we can never know what the counterfactual situation would have been, i.e., earnings in the absence of the injury or illness, it is impossible to know exactly what earnings have been lost. However, these modern studies based on administrative data from purposely selected comparison groups, improve our estimates of wage replacement adequacy significantly. This in turn lends greater credibility to the results of the empirical studies.

However, as we have seen, there is still no single answer to the benefit adequacy question. Are workers' compensation wage replacement benefits adequate? It depends on where, when, and for whom the question is asked. While overall adequacy measures may be useful to track variation across time or jurisdiction, measures of adequacy for subgroups of the injured population (for example, by gender, age, type of injury, race/ethnicity, or occupational category) may be more meaningful. Measures comparing different groups as defined by workers' compensation claim status may be even more useful (for example, TTD

claimants, PPD claimants, compromise and release claimants, and PTD claimants). It is clear from most workers' compensation statutes that policymakers think of these as distinct groups. Our analyses of benefit adequacy should do so as well.

A review of these studies has also revealed how slim our knowledge base really is. While five state studies of PPD benefits may be a fair start, we only have two studies of TTD benefits. This makes it difficult to draw any generalizations, especially when the results differ as much as those for Washington and Wisconsin. Should our conclusion be that these two states practice very different compensation philosophies, or that we do not trust our results? It is clear that additional studies are needed before firm conclusions can be drawn about wage replacement benefit adequacy in general.

A firmer conclusion is that the wage replacement standard of comparison appears to have inherent appeal for evaluation purposes. It seems appropriate to use such an individual yardstick to measure the adequacy of benefits. This might also facilitate discussion about the goals of workers' compensation policy. Why is the benefit for permanent disability different from that for temporary disability in many jurisdictions? What are policymakers trying to achieve? Can the proportion of lost wages that are replaced help inform our perspectives on such issues?

These modern analytical methods have very substantial data requirements and are costly and time consuming to conduct. However, this is due more to the intensity of the data preparation and data processing required than to any inherent complexity of the analysis. It seems clear that costs will decline as experience with these models increases and their estimation becomes more routine. The development of a standard, preferred methodology for such comparisons would help to reinforce this trend. Our hope is that this volume will help to stimulate development of such a standard, through further discussion and debate.

Of course, such methods may still be subject to some systematic bias that has not yet emerged from the scholarly review of these studies. Questions remain about whether different comparison groups produce different results (sensitivity analysis). Wage loss can be expected to vary with labor market conditions as well, as was demonstrated in California, and therefore earnings replacement rates probably will vary likewise.

Lastly, a number of issues need to be addressed before we can do meaningful and reliable interstate comparisons with wage loss studies. Clearly, the same data definitions, methods, and comparison groups must be applied across states. Comparisons must also allow for differences in the composition of occupations, industries, personal characteristics, firm characteristics, injury characteristics (to the extent that these are not endogenous), and probably many others. Then it might finally be possible to accurately measure differences in state workers' compensation benefit systems by a better yardstick than we have had heretofore, namely, the proportion of earnings actually replaced for injured workers.

## Notes

1. This means that they suffered no losses compared to other injured workers who were judged to have less than a 5 percent permanent disability rating. This suggests that the system wasn't very good at differentiating between the losses of people with 3 percent and 9 percent disability ratings, not that the latter lost no income.
2. These numbers result from combining the contested and uncontested cases, according to their frequency. In Wisconsin, only 14 percent of cases were contested, while in Florida (70 percent) and California (90 percent) a majority of PPD cases were litigated. Presumably, this affected the estimated replacement rates for uncontested cases reported above, as it is likely that scheduled losses played a much greater role in Florida and California among uncontested cases.
3. It is interesting that 15 years later, CWCI opined that, ". . . it is probably safe to assume that in the final analysis, *aggregate* replacement rates in California will probably be found to already meet or exceed the  $66\frac{2}{3}$  percent standard historically used as a proxy for 'adequacy'" (CWCI 1999, p. 14). This statement was in reaction to calls for a substantial benefit increase in California, based in large part upon the findings of benefit inadequacy from the RAND study reviewed below.
4. To qualify as similar wages, the log of the control's average quarterly preinjury wage must be equal to the log average quarterly wage for the injured worker plus or minus 10 percent of the standard deviation of the log of average quarterly wage of the population of PPD claimants with injuries in that quarter.
5. To verify the use of their comparison group, Boden and Galizzi (1998) compared statistics from a random group of workers, workers with minor injuries, and severely injured workers. They concluded that workers with minor injuries appeared to be more like severely injured workers than the employed population of Wisconsin. They also found that earnings in the calendar quarter following the injury for workers with 3 to 5 days of lost time due to injury and workers with 8 to

10 days' lost time were virtually identical. Also, preinjury earnings of workers with minor injuries were not statistically different than the preinjury earnings of severely impaired workers. Finally, a regression estimation based on first differences shows that earnings of workers with 8 to 10 days of lost time quickly recover to the level of the uninjured worker.

6. Year of injury turns out to be a critical analytical issue in California due to variation in labor market results. See CWCI (1999) for a full discussion of this issue.
7. We have converted their after-tax results to a pre-tax basis using data included in their article.
8. Boden and Galizzi (1998) originally developed 12 different projections to estimate losses beyond the observed period. Of these, the method chosen assumes that losses continue to decline (or increase) for two years after the observed period at the same rate as was estimated at the end of the observed period. Losses then remain fixed until the end of the projection period (10 years) or until age 75. Boden and Galizzi also account for the variance in employment rates by age.
9. See Barth and Niss (1999) for a description of the variety of PPD methods.
10. However, it is worth noting that the results are quite sensitive to the methodology selected. The comparison of PPD benefits in three states presented in Biddle, Boden, and Reville (2001) indicated that Wisconsin replaced 46 percent of pre-tax wages lost over 10 years, compared to 29 percent in the later study. Because the underlying data were the same, the differences are simply the result of different methods and assumptions.



## 6

# Summary and Conclusions

A critical objective of workers' compensation programs is to maintain a socially acceptable income stream for disabled workers while they recover from job-related injuries or illnesses. This report addresses a key aspect of workers' compensation systems: to what extent do cash benefits paid to injured workers replace their lost earnings?

We recognize that there are many other goals for workers' compensation programs. These include providing sufficient medical care and rehabilitation services, efficiency of the benefit delivery system, and affordability of the program for employers and workers. We have deliberately avoided consideration of these other goals to make this project manageable. In any event, the adequacy of wage replacement benefits is such a critical goal for workers' compensation systems that the topic deserves examination by itself.

A Study Panel of the Workers' Compensation Steering Committee of the National Academy of Social Insurance (NASI) (see p. 145) has been considering the issue of benefit adequacy for several years. These practitioners and scholars of workers' compensation have met periodically to review research findings and discuss analytical issues. Some members of the group volunteered to draft sections of this book, which were then reviewed and discussed in detail by the entire group.

In this book, we examine earnings replacement in several ways. First, what are the earnings losses suffered by disabled workers, and to what extent are those losses replaced by the benefits received through workers' compensation programs? We review both "theoretical" and "empirical" answers to these questions. The former is represented by the study of statutory benefits in Chapter 4, while the latter is presented in a series of wage loss studies in Chapter 5.

Next, to what extent are these benefits adequate? To answer this question, we must confront the issue of what we mean by "adequate" benefits. This is a very controversial question, with many conflicting points of view. Most members of the panel recommend that a fraction of lost wages should be replaced by workers' compensation benefits, recognizing the need to strike a balance between substantial income

support and return-to-work incentives and critical affordability objectives. To some members of the panel, adequate benefits would be benefits that replace 100 percent of lost earnings.

We use several yardsticks for wage replacement adequacy. First, we use the historical yardstick of replacing two-thirds of gross wages as a measure of benefit adequacy. While this may not be the ideal measure, 36 states now use it as their statutory replacement rate for temporary total disability (TTD).<sup>1</sup> We acknowledge that this is a somewhat arbitrary choice, but it has the advantages of historical primacy, widespread acceptance, and analytical simplicity.

Second, we use the Model Workers' Compensation Act (Revised), promulgated by the Council of State Governments in 1974. The Model Act represented an attempt to specify the benefit structure that would constitute "best practice" in workers' compensation, largely through implementing the recommendations of the National Commission on State Workmen's Compensation Laws. While not all members of the panel approve of this measure, we use the standards of the Model Act as another yardstick to evaluate the overall benefit structure of workers' compensation programs.

Finally, we have a social policy interest in preventing workers and their families from becoming destitute because of work injuries. When the National Commission on State Workmen's Compensation Laws issued its report in 1972, maximum weekly benefits in many states were so low that full-time workers who had earned reasonable wages could fall into poverty while receiving workers' compensation benefits (NCSWCL 1972, p. 18). To determine whether this is still occurring, we asked: "Are workers' compensation wage-replacement benefits sufficient to keep injured workers from falling below the official poverty line?" For this assessment we compare statutory benefit levels to the U.S. poverty threshold for a family of four.

## FINDINGS

Our historical analysis of statutory workers' compensation benefits in Chapter 4 found a significant upward trend in statutory benefit levels after the *Report of the National Commission on State Workmen's Com-*

*pensation Laws* was released in 1972. With regard to the question of social adequacy, the average workers' compensation weekly benefit for TTD rose from about 80 percent of the poverty level for a family of four in 1972 to around 110 percent in 1998 (see Figure 4.3, p. 74). However, substantial interstate variation remains, and average TTD benefits in 16 states still were below the poverty level in 1998 (see Figure 4.4, p. 75).

When statutory workers' compensation benefits are measured against the benefit levels included in the Model Act (Revised) adopted by the Council of State Governments, it appears that TTD benefits have improved steadily relative to the Model Act, rising from an average of 60 percent in 1972 to nearly 90 percent by 1998 (see Figure 4.9, p. 88). Trends in benefit levels for permanent disability claims and fatal claims also improved substantially in the 1970s but have been relatively constant for the past 20 years.

In summary, evidence from the analysis of statutory benefits suggests that TTD benefits rose relative to the poverty threshold and came closer to meeting the levels in the Model Act over time. No similar trend is evident for the more expensive permanent disability benefits.

The panel believes it is vital to check these findings on statutory benefits with the results of recent empirical wage loss studies. The wage loss studies compare the benefits received by injured workers with estimates of the earnings they lost after the injury. Thus, wage loss studies offer two advantages over statutory benefit measures: 1) the measurement of actual benefits received, and 2) an improved estimate of wage losses due to disability.

In the late 1970s, Berkowitz and Burton (1987) conducted the first wage loss study in three states, California, Florida, and Wisconsin, with funding from the National Science Foundation. They found that replacement rates for permanent disabilities varied substantially among jurisdictions and among workers within jurisdictions. The average earnings replacement rate for 1968 claimants was 75 percent in Wisconsin, 59 percent in Florida, and 46 percent in California.

Twenty years later, several researchers adopted the methods used in this early study to review benefit adequacy in different states. These "modern" wage loss studies are described in Chapter 5. In California, a group at the RAND Institute for Civil Justice conducted a series of studies of benefit adequacy for the California Commission on Health

and Safety and Workers' Compensation. Their innovation was to match the preinjury earnings of injured workers to similar workers in the same firms. Then, the subsequent earnings of the matched, uninjured workers make possible more realistic estimates of earnings losses for injured workers.

Reville and his colleagues (Peterson et al. 1998) found that the level of wage replacement for cases involving permanent partial disability (PPD) seemed to come close to statutory wage replacement rates when evaluated shortly after the injury, but appeared much less adequate when viewed over a longer period of time. For California injuries in 1992–1993, aggregate benefit payments after 3 years were between half (54 percent) and three-quarters (74 percent) of lost wages (see Table 5.1, p. 113). The major difference was due to the interpretation of the periods of zero reported earnings.<sup>2</sup> But when results were extrapolated for 10 years, the results were strikingly different. Most workers' compensation benefits were paid in the first 3 years after injury, but many workers continued to experience substantial wage losses into the future, so losses far outstripped benefits after the initial period. As a result, aggregate benefit payments compensated just 25 to 29 percent of estimated aggregate losses over 10 years.

In Wisconsin, Boden and Galizzi (1999) conducted a similar study of earnings replacement losses for the Workers Compensation Research Institute. While they employed a slightly different technique to estimate what the earnings of the injured workers would have been in the absence of injury, and included all injuries (not just PPDs), their methodology was otherwise similar to the RAND study. When losses were estimated for 10 years after injury, aggregate benefits replaced just under half of losses (45 percent) for men and somewhat less (37 percent) for women (see Table 5.3, p. 117).

Boden and Galizzi also found that the greater losses were concentrated in a minority of long-duration cases. Longer-lasting injuries included those with PPD payments, compromise settlements, or TTD payments that lasted more than 16 weeks. These three groups together accounted for one in four injured workers in the study, but involved three out of four dollars of aggregate earnings losses.

Biddle (1998) conducted a similar wage loss study as part of a legislative review of the workers' compensation system in Washington. That study verified that aggregate losses are larger and wage replace-

ment is lower when results are extrapolated for 10 years after the injury. This was particularly true for PPD cases because they are often settled with lump-sum payments in Washington. Counting those settlements when they are paid, the aggregate earnings replacement rate for Washington PPD cases appeared to be nearly 100 percent after 3.5 years; the replacement rate dropped to 34 percent when losses were extrapolated for 10 years. The Washington study also confirmed that large losses are concentrated in a minority of cases.

Most recently, Reville, Boden, et al. (2001) conducted a study of New Mexico PPD workers' compensation benefits. They also brought the results of the other wage loss studies into a common analytical framework to facilitate comparisons among five states. Focusing only on PPD claims, they extrapolated aggregate wage losses and benefits paid for 10 years after the injury. Table 6.1 shows that under identical assumptions, 10-year wage replacement rates ranged from a low of 29 percent in Wisconsin to a high of 46 percent in New Mexico. No state exceeded 50 percent wage replacement for permanent partial disabilities.

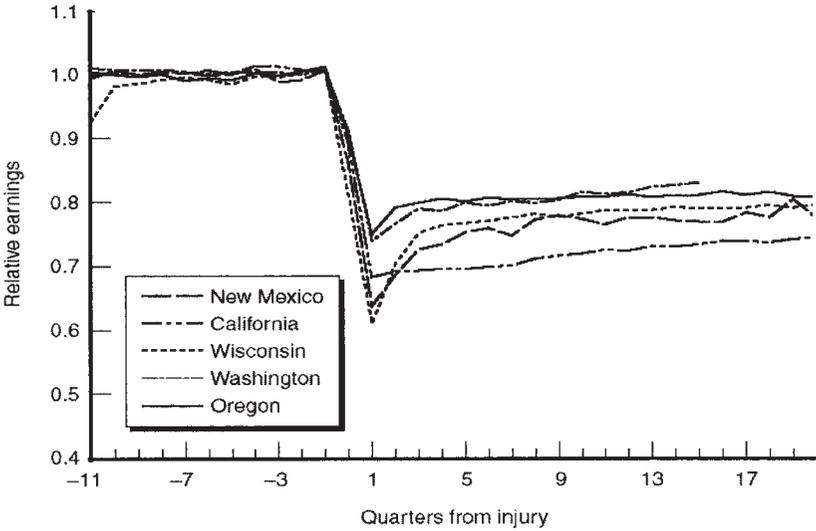
Further, Figure 6.1 shows that aggregate wage losses continue at significant levels (15 to 20 percent) even four to five years after injury. Yet, most workers' compensation payments occur within the first two to three years. These results indicate that replacement rates for PPDs in

**Table 6.1 Ten-Year Earnings Losses and Replacement Rates for Permanent Partial Disability Claimants**

	New Mexico	Washington	California	Wisconsin	Oregon
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 (%)	20	16	25	23	20
Pretax replacement rate (%)	46	41	37	29	42

SOURCE: Reville, Boden, et al. (2001, p. 50).

**Figure 6.1 Relative Earnings of PPD Claimants as a Fraction of Comparison Workers**



SOURCE: Reville, Boden, et al. (2001, p. 48).

the aggregate fall short of the yardstick of two-thirds of gross wages, often by a large margin.

## CONCLUSIONS

The study panel believes that wage loss studies are the best yardstick to measure the adequacy of benefits. We feel the wage replacement standard of comparison has great intuitive appeal for the evaluation of benefit adequacy, and comparing the outcomes for injured workers to the uninjured provides a natural labor market context for such studies.<sup>3</sup> In those states that have been studied, 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.

Additional wage loss studies from different jurisdictions are needed to confirm these findings. In particular, it would be helpful to have more studies that include TTDs and studies from states with different methods of setting PPD benefits. Such studies would inform judgments on the question of adequacy for different kinds of benefits, as well as the appropriate level of employer responsibility for wage replacement in case of permanent disability.

The panel also notes that it is not yet possible to determine whether the statutory benefit studies presented earlier provide an appropriate substitute for a wage loss study. Preliminary analysis of the few observations available indicate a positive, though not significant, correlation (correlation coefficient of 0.4) between the wage replacement rates from wage loss studies and the results of the statutory benefit studies reported earlier. More work is needed to understand the connections between statutory benefit levels and actual benefits paid.

The panel recognizes that many more questions need to be answered so that policymakers can improve workers' compensation benefit systems. For example, what is the distribution of wage losses? Do most injured workers receive benefits that meet the yardstick of two-thirds of gross earnings? Are there significant groups of workers who receive more or less than this standard? As suggested in recent studies, are large losses and replacement rates below the statutory yardstick concentrated in a minority of long-duration cases? If so, what more can we learn about why these losses occur, and what could be done to mitigate them? Appendix 6A includes an agenda of questions for further research to improve our understanding of wage replacement rates and to aid policy analyses.

Our last observation is that a problem of low or inadequate levels of wage replacement in workers' compensation programs might call for several complementary solutions. Depending on the reasons for the level of wage replacement, and the public policy decision on benefit plan design, which of necessity includes more factors than the wage replacement rate, one obvious approach would be to increase the level or duration of workers' compensation benefits. But another approach is to reduce wage losses. The ideal way to do this is by improving workplace safety and health. In addition, many employers have found that they are able to significantly reduce the incidence and duration of workers' compensation claims by improving the administration of claims, enhancing their labor-management relations climate, and doing more to accom-

modate injured workers on their prior jobs or on other jobs with the company.

State systems for claims administration and adjudication also make a difference. They can smooth the way for fair and prompt decisions that support adequate compensation and sustainable return to work, or they can exacerbate friction costs with extensive litigation or perverse incentives for workers, providers, and employers that undermine system goals.

Thus, we conclude that the policy remedy for a mismatch between the wage losses injured workers experience and the benefits delivered under workers' compensation programs requires attention to more than the basic level of benefits. Solutions also involve improving the overall performance of our 90-year-old workers' compensation systems for the benefit of injured workers, their employers, and our society as a whole.

## Notes

1. We use the term *statutory benefits* to indicate that these are the benefits specified in the workers' compensation statute and not measures of actual benefits that have been paid. Statutory replacement rates are subject to dollar minimums and maximums that cause benefits to be more or less than the statutory replacement rate.
2. The difference was due to whether periods of zero earnings were considered injury related or not.
3. As noted earlier, not all members of the panel believe that two-thirds of gross wages is necessarily an appropriate yardstick for cash benefits, nor has that yardstick been historically accepted as appropriate for PPD benefits.

# Appendix 6A

## A Research Agenda

Modern wage loss studies are an important breakthrough in measuring the level at which workers' compensation benefits replace lost earnings. These studies suggest that aggregate replacement rates are typically below the historical standard of two-thirds of gross earnings.

To act on these findings, policymakers will want to know more about why replacement rates for particular categories of workers are "high" or "low." Microdata on injured workers' actual experience with their workers' compensation system and their health and employment outcomes would be a valuable complement to what we have learned from wage loss studies. New data collection initiatives now under way in a handful of states may provide data on post-injury outcomes that would enable one to do these complementary analyses.

Beginning with a study in Wisconsin (see Galizzi, Boden, and Liu 1998; and Victor, Barth, and Liu 2003), the Workers Compensation Research Institute (WCRI) is supporting injured worker surveys in Texas, Massachusetts, Pennsylvania, and California, with plans to expand to additional states in the next few years. In addition, opportunities to link data from other wage replacement programs, such as Social Security Disability Insurance, would help us understand how workers' compensation fits into a broader concept of benefit adequacy in replacing lost earnings.

More complete data on injured workers' attributes and outcomes would enable us to answer the following types of questions:

1. To what extent could replacement rates from workers' compensation be increased through more effective assistance with return to work or job accommodations?
2. To what extent do workers with "low" replacement rates from workers' compensation 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?
3. Do injured workers also lose nonwage (fringe) benefits? Which benefits are lost, and what is the value of these losses to the worker? Does this change the adequacy of benefits?

4. How much are the offsetting savings to workers from reduced work expenses, such as commuting, child care, food, and clothing? And how do these savings impact benefit adequacy? How much are the increased costs to families because they must care for injured workers or replace household work formerly done by them?
5. How do benefits actually received compare to those set forth in the worker's compensation statute? Why the difference?
6. How are replacement rates affected by state maximums on workers' compensation benefits? (Maximum weekly rates are expected to lower replacement rates for higher earners.) And to what extent are replacement rates reduced by wage losses that last longer than workers' compensation benefits are paid?
7. To what extent are replacement rates impacted by state minimum benefit rules? (Again, this is an expected outcome that would increase replacement rates for very low earners.)
8. To what extent are replacement rates affected by lump-sum payments and the manner in which they are allocated?
9. To what extent are replacement rates affected by payment of scheduled benefits—that is—benefits based on injuries to specific body parts or physical impairment that are paid irrespective of actual wage losses? How do the replacement rates for these injuries compare to rates for nonscheduled injuries that are tied to predicted or actual wage loss? If wage replacement for scheduled injuries is relatively high, should this outcome be considered a problem? Or should it be viewed as equitable compensation for permanent impairment?
10. Are there differences in the level of wage replacement between highly educated and less skilled workers? Are there differences by skill level in terms of replacement rates during TTD versus PPD?
  - On the one hand, highly educated (and therefore presumably more highly compensated) workers might get lower replacement rates while they are out of work, because of maximums on benefits.
  - At the same time, highly educated workers might be more likely to recover their full preinjury earnings, despite permanent impairments, and therefore get higher replacement rates under scheduled payments for PPD.
11. 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-relat-

ed injury or disease exhibit the same or a different pattern of future wage loss than an absence due to some other reason?

12. Do systems that attempt to take individual circumstances and characteristics into account (and thus have higher friction costs) provide more adequate and equitable benefits than systems that do not (individual justice versus social justice approach)?
13. 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)?
14. To what extent do state and federal tax provisions affect wage replacement rates?



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