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Workers' Compensation and Disability Benefits: The Effect of the Permanent Partial Disability Multiplier and Settlement Method on Back Injury Claims in the State of Tennessee

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To the Graduate Council:

I am submitting herewith a dissertation written by Eric Allan Fenstemaker entitled "Workers' Compensation and Disability Benefits: The Effect of the Permanent Partial Disability Multiplier and Settlement Method on Back Injury Claims in the State of Tennessee." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in Human Ecology.

Susan M. Smith, Major Professor

We have read this dissertation and recommend its acceptance:

June Gorski, Paula Carney, Gergory Petty

Accepted for the Council:
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Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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We have read this dissertation
and recommend its acceptance:

Dr. June Gorski

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Interim Dean of Graduate Studies

WORKERS' COMPENSATION AND DISABILITY BENEFITS: THE EFFECT OF THE PERMANENET PARTIAL DISABILITY MULTIPLIER AND SETTLEMENT METHOD ON BACK INJURY CLAIMS IN THE STATE OF TENNESSEE

A Dissertation
Presented for the
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Eric Allan Fenstemaker
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ABSTRACT

Back pain is the leading cause of work place disability in Tennessee. The National Council on Compensation Insurance (NCCI, 2002) found that in the United States back claims account for thirty-two (32%) percent of all workers' compensation claims and the average cost of a back claim is roughly fifty (50%) percent higher than the cost of other work-related injuries. Previous research on Tennessee workers' compensation suggests that permanent partial disability benefits (PPD) are a major source of cost and litigation in a court based system (Gardner, Telles, & Moss, 1996; Boden, 1997; Ballantyne, 2003).

The workers' compensation system in Tennessee is a court based system. Trial courts have full discretion in determining the amount of permanent partial disability (PPD) awards. Workers' compensation claims may be settled under the following methods: (1) trial; (2) settlement approved by court - complaint filed; (3) settlement approved by court - complaint not filed; and (4) settlement approved by the Tennessee Department of Labor & Workforce Development.

Permanent partial disability (PPD) awards for back injuries are dependent upon whether the employer returned the employee to work after injury.[1] Permanent partial disability (PPD) indemnity benefit costs in Tennessee can be greatly influenced by the magnitude of the permanent partial disability multiplier (PPDM) (Garnder, Telles, & Moss, 1996; Boden, 1997; Ballantyne, 2003). The use of multipliers to assign permanent

[1] In 1992, the Tennessee Legislature limited disability ratings to be no more than 2.5 times the highest physician impairment rating for unscheduled injuries provided the employee was returned to work at the pre-injury wage or six (6) times the highest physician impairment rating for those employees who did not return-to-work.

partial disability (PPD) indemnity benefits is unique and utilized only by Tennessee (Gardner, Telles, & Moss, 1996; Boden, 1997; Ballantyne, 2003).

A previous published study on Tennessee reported that permanent partial disability (PPD) awards for low back injuries vary among judicial districts and that the application of the multipliers may be one of the causes of variation in awards (Boden, 1997). Previous research has not investigated whether permanent partial disability (PPD) awards for back injuries vary by the method of settlement.

This study investigated the Tennessee workers' compensation system to determine if benefit variation existed among settlement methods for back injury claims. Workers' compensation claim data from 2000 – 2003 was obtained from the Tennessee Department of Labor & Workforce Development. Regression analysis was used to determine whether there was a significant difference between group means using a p value of .05.

The settlement method found to have the greatest influence on permanent partial disability (PPD) awards in return-to-work and a non-return-to-work claim was trial. A claim resolved at trial was found to be four percent (3.729%) more in permanent partial disability (PPD) indemnity benefits paid when compared to settlements approved by the Tennessee Department of Labor in return-to-work claims and eleven percent (11.406%) more in non-return-to-work claims.

Employees with a work-related back injury claim had a forty-three percent (43.5%) probability of having surgery. Of the employees who had back surgery, sixty-one percent (61.3%) were able to return-to-work with their pre-injury employer.

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CHAPTER I

Introduction

The purpose of this study was to investigate the relationship between the permanent partial disability multiplier (PPDM) for back injuries and the settlement method used (settlement approved by court - complaint filed; settlement approved by court - complaint not filed; settlement Tennessee Department of Labor; and trial) to reach a permanent partial disability (PPD) award. The settlement methods evaluated in this study were limited to the options utilized and reported to the Tennessee Department of Labor for the years 2000 – 2003 and recorded on the Workers' Compensation Statistical Data Form (SD-1).

Tennessee is the only state that adds a permanent partial disability multiplier (PPDM) to medical impairment ratings. Permanent partial disability (PPD) benefits are benefits paid to an injured employee for related labor market conditions and the future earnings loss that result from a work-related injury. The permanent partial disability multiplier (PPDM) is linked to permanent partial disability (PPD) benefits by statute (T.C.A. §50-6-241). The total amount of benefits paid are limited by the multiplier cap and the multiplier cap utilized is dependent upon whether or not the injured employee returned to work for the pre-injury employer. Depending on the circumstances maximum permanent partial disability (PPD) awards are capped at two and one-half (2 ½) times the medical impairment rating in return-to-work (RTW) claims and six (6) times the medical impairment rating in non-return-to-work (NRTW) claims. Permanent partial disability

benefits (PPD) are not to exceed four hundred (400) weeks of benefits for unscheduled injuries. The caps do not apply to permanent total disability.

Types of Benefits

Tennessee workers' compensation pays both medical care and cash benefits. Cash benefits vary depending on the length of lost time from work and severity of the disability. Permanent partial disability (PPD) benefits are commonly paid to injured employees with impairment ratings that are judged to affect the injured employees earning capacity (Tinker v. Bessemer Coal, Iron & Land Co., 1964).

The Tennessee Workers' Compensation Advisory Council (2003) reported a statewide average of $16,772.33 for medical benefits and a statewide average of $29,299.43 for permanent partial disability (PPD) awards using 2002 Statistical Data Form (SD-1) claim data. Medical benefits ranged from a low of $13,603.22 to a high of $22,009.04 among Tennessee's thirty-one (31) judicial districts[2]. Permanent partial disability (PPD) benefits for return-to-work (RTW) employees ranged from a low of $23,363.92 to a high of $49,677.85 among Tennessee's thirty-one (31) judicial districts. The statewide average for the permanent partial disability percentage was 19.7% and ranged from a low of 15.9% to a high of 32.1% among Tennessee's thirty-one (31) judicial districts. The permanent partial disability multiplier[3] (PPDM) had a statewide average of 2.3 for return-to-work (RTW) claims involving body-as-a-whole injuries and

[2] If a settlement contained a lump sum payment for the closure of future medical treatment that lump sum payment is included in the medical benefit data.

[3] The multiplier is the ratio of the permanent partial disability award to the highest physician impairment rating issued an injured employee. As an example, a 35% permanent partial disability award is divided by the highest physician impairment rating of 10% resulting in a multiplier of 3.5.

ranged from a low of 1.7 to a high of 2.9 depending on the judicial district. Permanent partial disability (PPD) benefits for non-return-to-work (NRTW) employees ranged from a low of $16,471 to a high of $95,181.19 among Tennessee's thirty-one (31) judicial districts. The statewide average for the permanent partial disability percentage was 34.4% and ranged from a low of 13.0% to a high of 49.2% among Tennessee's thirty-one (31) judicial districts. The permanent partial disability multiplier (PPDM) had a statewide average of 3.2 for non-return-to-work (NRTW) claims involving body-as-a-whole injuries and ranged from a low of 1.8 to a high of 4.9.

Conducting research to better understand how variation in benefits are influenced by policy developments and also by how the method of settlement affects benefit awards for the same injury is important to the knowledge necessary to recommend changes and increase benefit equity among Tennessee judicial districts. A published study by Boden (1997) found that workers in Tennessee with similar body-as-a-whole injuries received significantly different permanent partial disability (PPD) indemnity benefits. The Boden (1997) study analyzed both awarded and settled claims during 1990 and 1992. This study did not investigate differences on how Tennessee claims were resolved as reported on Tennessee's Statistical Data Form (SD-1). Other published studies have reported on the principal cost drivers (medical and indemnity benefits) and system performance of Tennessee's workers' compensation system (Gardner, Telles, & Moss, 1996; Ballantyne, 2003). Previous published studies have not assessed whether the utilization of Tennessee's different settlement methods have contributed to the variances in the permanent partial disability multiplier (PPDM) and the amount of permanent partial disability indemnity benefits paid for back injury claims.

Need for the Study

Permanent partial disability (PPD) indemnity benefit costs in Tennessee can be greatly influenced by the magnitude of the permanent partial disability multiplier (PPDM). The use of multipliers to assign permanent partial disability (PPD) indemnity benefits is unique and utilized only by Tennessee. Previous published research on Tennessee workers' compensation has indicated that permanent partial disability (PPD) awards for low back injuries vary among judicial districts and among injuries of a similar nature. Previous research suggests that the claims resolved at trial may result in a higher assignment of the permanent partial disability multiplier (PPDM) than other settlement methods (settlement approved by court - complaint filed; settlement approved by court-complaint not filed; and settlement Department of Labor). However, no previous published research has confirmed whether or not the settlement method used to determine a permanent partial disability (PPD) award, such as a settlement Department of Labor, influences the magnitude of the permanent partial disability multiplier (PPDM) for that particular claim (Gardner, Telles, & Moss, 1996; Boden, 1997; Ballantyne, 2003).

Statement of the Problem

Tennessee is the only state that adds a permanent partial disability multiplier (PPDM) to medical impairment ratings. Permanent partial disability (PPD) benefits are benefits paid to an injured employee for related labor market conditions and the future earnings loss that result from a work-related injury. Previous published research has criticized the way in which workers' compensation systems in the United States use the permanent partial disability (PPD) ratings resulting in inappropriate compensation

(Kessler, 1970; Stone, 1984; Hadler, 1990; Pryor, 1990; Harber, 1994; Gardner, Telles, & Moss, 1996; Boden, 1997; Ballantyne, 2003). A court-administered system such as the one in place in Tennessee may create "various systems" at work which cause differences in benefit payments for workers with similar injuries (Gardner, Telles, & Moss, 1996; Boden, 1997; Ballantyne, 2003). The characteristics associated with this variation are not fully understood. Previous research has reported the permanent partial disability multiplier (PPDM) to influence benefit equity across judicial districts for body-as-a-whole injuries. There is a general concern about this variance between districts because this may be resulting in benefit inequity and also may be reducing Tennessee's business competitiveness (Cruz, 2004).

Purpose of the Study

The purpose of this study was to investigate the relationship between the permanent partial disability multiplier (PPDM) for back injuries and the settlement method used (settlement approved by court - complaint filed; settlement approved by court - complaint not filed; settlement Tennessee Department of Labor; and trial) to reach a permanent partial disability (PPD) award.

Research Questions

1. What are the selected demographic and injury characteristics of Tennessee injured employees with a back claim for the years 2000 – 2003?

2. Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees in Tennessee differ based on age, education level and injury characteristics?
3. Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees in Tennessee differ based on age, education level and injury characteristics?
4. Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees in Tennessee significantly differ based on the settlement method used to reach a permanent partial disability award?
5. Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees in Tennessee significantly differ based on the settlement method used to reach a permanent partial disability award?
6. Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees significantly differ between judicial districts in Tennessee?
7. Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees significantly differ between judicial districts in Tennessee?
8. Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees in Tennessee significantly differ by geographic region (East, Middle and West) based on the settlement method used to reach a permanent partial disability award?

9. Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees in Tennessee significantly differ by geographic region (East, Middle and West) based on the settlement method used to reach a permanent partial disability award?

Assumptions

The basic assumptions made regarding this study were:

1. The data retrieved from the Tennessee Statistical Data Form (SD-1) were accurate.
2. The data retrieved from the Tennessee Workers' Compensation Computer System (WCS System) were accurate.
3. The population of claim data retrieved for use in this study represents a majority of employers in the state of Tennessee.
4. The number and type of claims submitted to the Tennessee Department of Labor is representative of previous years claim data.

Delimitations

For the purpose of this study the following delimitations were formulated:

1. This study was delimited to back claims that settled in 2000 - 2003.
2. This study was delimited to the available data generated by the Tennessee Workers' Compensation Computer System (WCS System).
3. This study was delimited to permanent partial disability (PPD) indemnity benefits paid for a back injury claim.

Limitations

The study was limited in the following ways:

1. In the state of Tennessee there are a large number of courts at which a workers' compensation claim can be heard and therefore, this study is limited in terms of how judges interpret the law when assigning a final permanent partial disability (PPD) rating and award.
2. The scope of this study was limited to a review of only those workers' compensation claims which were approved by a court of competent jurisdiction or the Tennessee Department of Labor approved the settlement and a Statistical Data Form (SD-1) was filed with the state.
3. Individual claim data is dependent upon the extent the Statistical Data Form (SD-1) is completed.
4. The scope of this study was limited to partial data across districts.

Discussion of Key Concepts and Definitions of Terms

Tennessee's Benefit Configuration

Tennessee's workers' compensation system pays death, medical and indemnity benefits. Medical benefits are linked to reasonable and necessary medical and surgical treatment, medicine, medical and surgical supplies and all other apparatus deemed necessary and ordered by the attending treating physician (T.C.A. §50-6-204). Indemnity benefits include: temporary total disability (TTD) benefits, temporary partial disability

(TPD) benefits, permanent partial disability (PPD) benefits, permanent total disability (PTD) benefits and death benefits. Tennessee is considered a "non-wage" loss state.

When an employee reports an injury the employer is required to complete Form C-20 (First Report of Injury) and offer a panel of physicians from which the employee selects one physician to conduct physical examinations and provide a treatment plan if necessary. The insurer must make personal contact with the employee within two (2) working days of notice of injury and compensability shall be determined within fifteen days (15) of notice of injury. Denial of claims is supported with documented results of the investigation and Form C-23 (Notice of Denial) filed with the Tennessee Department of Labor. Compensability of a claim is handled according to Tennessee Claims Handling Standards until the employee reaches maximum medical improvement (MMI).

An employee is entitled to indemnity benefits when the employee does not fully recover from a work-related injury. Typically, the treating physician will assign a medical impairment rating (percentage of disability) and state the body part involved and may also assign permanent work restrictions. There are many variables involved (i.e., age, education and surgery) in the computation and determination of an appropriate settlement amount. Many of these variables have not been fully investigated to understand their impact on the permanent partial disability multiplier (PPDM).

Vocational Disability

Tennessee law makes a distinction between a medical impairment rating and a vocational disability rating. Compensation for a work-related injury is paid on the basis of loss of earning capacity (Tinker v. Bessemer Coal, Iron & Land Co., 1964). Tennessee

pays four (4) weeks of benefits for each point of medical impairment[4]. A medical impairment rating is the *minimum* amount of a permanent partial disability (PPD) indemnity benefit an employee may accept unless the claim is settled on a "doubtful and disputed" basis. The degree of medical impairment is expressed as an *impairment rating* and is generally determined by the authorized treating physician. The medical impairment or disability rating is an attempt to quantify the degree to which an individual is disabled. This is the most common way of setting compensation for permanent partial disability (PPD) indemnity awards among U.S. jurisdictions (Barth and Niss, 1999). Tennessee limits the maximum total compensation that can be paid to an injured employee. The maximum benefit is calculated by taking the maximum weekly benefit rate times four-hundred (400) weeks of benefits for unscheduled injuries.[5]

Vocational disability, the ultimate issue in Tennessee workers' compensation claims (T.C.A. §50-6-241) is the assessment to take into account whether there has been a decrease in the employee's ability to earn wages in any line of work available considering the disabled condition. In assessing the extent of an employee's vocational disability the employee's age, education, skills and training, local job opportunities, medical impairment rating, permanent work restrictions and the capacity to work at the types of employment available in the employee's disabled condition ultimately determine

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[4] Take as an example an employee who received a medical impairment rating of 1% to the body-as-a-whole and had a weekly compensation rate of $100 per week. The following calculation demonstrates the amount of benefit for each point of impairment: 400 x .01 = 4 weeks of benefits. This 4 weeks of benefits is then multiplied (4 x $100 = $400) by the employees weekly compensation rate. In this example, the employee would be entitled to a minimum of $400 of permanent partial disability benefits. The Permanent Partial Disability Multiplier (PPDM) in this example is equal to 1.

[5] The maximum weekly benefit is 66 2/3% of the employee's average weekly wage up to 100% of the state's average weekly wage. The state's average weekly wage is determined by the Department of Labor as of the preceding January 1 and adjusted annually and becomes effective July 1 of each year.

the percentage of vocational disability. The permanent partial disability multiplier (PPDM) summarizes the effect of a one point increase in the medical impairment rating on the final permanent partial disability rating (Boden, 1997).

The Permanent Partial Disability Multiplier

Permanent partial disability (PPD) awards and the multiplier used to determine the indemnity benefit for back injuries are dependent upon several factors (T.C.A §50-6-241). For injuries where the employer returned the employee to work at the same (or greater) wage the maximum permanent partial disability (PPD) indemnity benefit is limited to two and one-half (2 ½) times the medical impairment rating. In instances where the employer does not return the employee to work the maximum permanent partial disability (PPD) indemnity benefit is limited to six (6) times the medical impairment rating. The *"multiplier caps*[6]*"* may be exceeded in appropriate cases where the trial judge makes a specific documented finding supported by clear and convincing evidence that the employee lacks three (3) of the four (4) following conditions: (1) "the employee lacks a high school education, GED, or cannot read at the eighth (8) grade level; (2) the employee is fifty-five (55) years of age or older; (3) the employee has no reasonable transferable job skills; and (4) the employee has no reasonable employment opportunities available in the local job market" (T.C.A. §50-6-242).

[6] Tennessee is the only state that utilizes a "multiplier cap" for unscheduled injuries and resulted from negotiations during the 1992 legislative reform.

Settlement Method

Tennessee utilizes a court-administered system for resolving workers' compensation claims. The state allows for all settlements of compensation by agreement of the parties and all awards of compensation made by a court of competent jurisdiction. How a claim is resolved is listed on the Statistical Data Form (SD-1). There are five options:

1. "Trial – applicable only when the claim has been tried by the court;
2. Settlement Approved by Court – Complaint Filed – applicable only when a lawsuit has been initiated by the filing of a complaint and summons;
3. Complaint Filed – Voluntary Dismissal taken;
4. Settlement Approved by Court – Complaint not Filed – applicable only when a lawsuit has not been initiated by the filing of a complaint; and
5. Settlement Approved by Department of Labor – applicable only when the approval is by the Department" (Workers Compensation Statistical Data Form, 2006).

Copies of all settlements and releases are required to be filed by the employer with the Department of Labor within ten (10) days of the settlement and settlement agreements become part of the permanent records of the Department of Labor (T.C.A. §50-6-228).

Definitions of Terms

This section operationally defines the terms used in this study:

1. Body-as-a-whole – all other injuries not specifically provided for in Tennessee Code Annotated §50-6-207 are considered injuries to the body-as-a-whole.

2. Demographics – for purposes of this study demographics are limited to age, education level, TN county of injury, judicial district, geographic region and year of injury.
3. Disability – is defined as "an alteration of an individual's capacity to meet personal, social, or occupational demands because of impairment" (American Medical Association, 2001).
4. Education Less than High School – identifies individuals with some educational background however did not earn a high school diploma or GED.
5. Education Greater than High School – identifies individuals with educational achievements beyond a high school diploma.
6. Final Disability Rating – represents the overall percentage of disability for a particular individual. It is derived from the final settlement terms and is based in part as a reduction in wage-earning capacity as a result of an injury.
7. Framework – identify priorities addressing issues of inequities and explain standards for acceptable outcomes.
8. Impairment Rating – is defined as the medical impairment rating to establish a change from normal or preexisting state of a body part or organ system and its functioning (American Medical Association, 2001).
9. Indemnity Benefit – is the monetary sum paid when an employee experiences a loss of earning capacity as a result of a work-related injury.
10. Injured Employee – for purposes of this study an injured employee will be limited to back injury, demographic, socioeconomic and injury characteristics.

11. Injury Characteristics – for purposes of this study injury characteristics are limited to able to return-to-work, date of injury, days to maximum medical improvement, treating physician impairment rating, independent medical examination (employee and/or employer), number of days lost, permanent partial disability percentage, permanent partial disability multiplier, settlement method and surgery.
12. Judicial District Variation – is the ratio of average permanent partial disability rating to average medical impairment rating.
13. Lumbar Spine, Thoracic Spine and Cervical Spine Diagnosis Related Estimate (DRE) Category – apart from category I, each category includes a range to account for the resolution or continuation of symptoms and their impact on the ability to perform activities of daily living (ADL) (American Medical Association, 2001).
14. Maximum Medical Improvement – establishes the medical opinion that an injured employee is stabilized and unlikely to change substantially in the next twelve (12) months.
15. Multiplier Caps – based upon a two-tier structure and on whether an employee returns to work after an injury with the same employer. The multiplier cap provides a maximum award an employee can receive for permanent partial disability. Tennessee is the only state to utilize a multiplier cap.
16. Non-Return-to-Work – describes an outcome where the injured employee through no fault of their own does not return-to-work with the pre-injury employer after

reaching maximum medical improvement. The employee is capped at six (6) times the highest medical impairment rating.

17. Non-Wage Loss State – permanent partial disability benefits are not based on actual wage loss.
18. Permanent Partial Disability Benefits (PPD) – if an employee retains a permanent impairment rating (PPI) the employee is almost always entitled to permanent partial disability (PPD) benefits which is a monetary sum paid by the employer to compensate the employee for the loss of the ability to compete for jobs in the open market.
19. Permanent Total Disability Benefits (PTD) – this benefit is paid to an injured employee during a period of permanent total disability and is limited by eligibility to receive full benefits in the Old Age Insurance Benefit Program.
20. Permanent Partial Disability Percentage – is the final disability rating associated with a work-related injury. It is based on the award as a percent of 400 weeks of benefits.
21. Return-to-Work - describes a standard that returns an injured employee back to work with the pre-injury employer. Accordingly, if the employer establishes that a job offer was made (within any permanent work restrictions) and the employee voluntarily declines the job offer, the employee is capped at 2 ½ times the highest medical impairment rating.
22. Settlement Method – identifies one of four possible resolution mechanisms (settlement approved by court - complaint filed; settlement approved by the court

- complaint not filed; settlement Department of Labor; and trial) as reported on the Tennessee Statistical Data Form (SD-1).

23. Socioeconomic characteristics – for purposes of this study, socioeconomic characteristics are limited to average weekly wage and compensation rate.
24. Temporary Partial Disability Benefits (TPD) – this benefit is paid while the injured employee is under an authorized treating physicians care for a work-related injury and unable to work at full capacity and/or less than an average work week in terms of hours worked or income earned.
25. Temporary Total Disability Benefits (TTD) – this benefit is paid while an injured employee is under an authorized treating physicians care for a work-related injury and unable to work at any kind of job.
26. Typical Injured Employee – a theoretical employee created for statistical analysis and comparison of data.
27. Unscheduled Injuries – denotes all injuries not covered by the Tennessee schedule listed in Tennessee Code Annotated §50-6-207.
28. Vocational Disability – occupation limited and degree of incapacity to earn income in any line of work available considering the employee's disabled condition.

Summary

The purpose of this chapter was to provide a framework for the investigation of the relationship between the permanent partial disability multiplier (PPDM) for back injuries and the settlement method used (settlement approved by court - complaint filed;

settlement approved by court - complaint not filed; settlement Tennessee Department of Labor; and trial) to reach a permanent partial disability (PPD) award.

Previous published reports have identified inconsistencies among Tennessee's thirty-one (31) judicial districts to consistently and equitably award permanent partial disability (PPD) indemnity benefits for body-as-whole injury claims involving the back. Most state workers' compensation systems define disability as a reduction in future wage-earning capacity as a result of a work-related injury. Defining what constitutes permanent partial disability (PPD) is not universally accepted as can be seen by the differences in perceptions and studies reviewed in the next section.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The purpose of this chapter was to review related research that investigated variation in the structure and cost of permanent partial disability (PPD) benefits for employees who filed a compensable work-related back injury claim. The literature review consisted of related published research, working papers and reports focusing on the most significant influences to back injury claims. The literature review focused on the content, methodology, content and methodology related to variation, structure and cost of compensable work-related back injury claims that involved permanent partial disability (PPD) benefits paid to workers.

Research and Literature Related in Content

An Overview: Disability

The insurance cost of disability had been estimated at $40 billion in 1987 (Snook and Webster, 1987). In 1991, 13.3 million people in the United States had some type of work disability (Feuerstein, 1991). LaPlante (1991) estimates that 36 million persons or fourteen percent (14%) of the U.S. population are limited in selected activities. Feuerstein (1991) suggests that roughly nine percent (8.6%) of the working population

(16 - 64 years) has some type of work disability. Table 2.1 illustrates the percent of disabled workers in America in 1991.

Social Security, workers' compensation and private health insurance encompass the main types of disability insurance (Snook and Webster, 1987). Reville and Schoeni (2003) define disability using two methods: *"individuals reporting a work-limiting impairment or health condition and individuals receiving Social Security Disability Insurance."* Using the 1992 Health and Retirement Study, Reville and Schoeni (2003) point to the fact that thirty-one percent (31%) of the people aged 52 – 61 are receiving Social Security Disability due to a workplace injury or illness.

Impact of Back Pain

The impact of back pain in industry has been studied extensively over the last forty (40) years with no evidence of decline (Snook, 2004). The influence of occupational factors on more catastrophic claims is gaining momentum in the literature

Table 2.1

Estimate: Working Population with a Work Disability in 1991.

Age Group	Percent Disabled
16 – 24	3.5%
25 – 34	5.4%
35 – 44	7.5%
45 – 54	11.0%
55 – 64	22.2%

From "A Multidisciplinary Approach to the Prevention, Evaluation, and Management of Work Disability," by M. Feuerstein, 1991, *Journal of Occupational Rehabilitation, 1*(1), p.6.

(Murphy and Courtney, 2000). The majority of reported outcomes focus on the direct economic costs and length of disability. There is also a large body of literature focusing on the overall burden of occupational disability on society. More recently econometric studies examine wage loss after injury. The findings from these studies suggest that real wage loss is far greater than the difference between pre-injury earnings and indemnity benefits.

The relationship of back disability to occupational, demographic, diagnostic, psychological stress, recovery, return-to-work and injury factors is reported in the literature. Few studies have examined the effect of social consequences on work-related injuries and their impact on injured workers outside of their work environment (Dembe, 2001). The effect of gender and cultural background is also limited in many clinical studies.

Economic Consequences

Direct costs associated with low-back injury include medical treatment, temporary disability payments, lost time at work, administration of programs and either permanent total or permanent partial disability (PPD) benefits (Burton and Spieler, 2001; Weil, 2001). Medical payments rose from 43.3% in 1999 to 45.2% in 2000 (National Academy of Social Insurance, 2002). Cash benefits accounted for the remainder of state benefits paid totaling 54.8% in 2000. Diagnostic procedures account for roughly twenty-five percent (25%) of total medical costs followed by surgery (21%) and physical therapy (20%) (Williams, Feuerstein, Durbin, & Pezzullo, 1998). Table 2.2 illustrates workers' compensation benefits by type of insurer for years 1987 – 2002. Table 2.3 illustrates a

Table 2.2 Workers' Compensation Benefits by Type of Insurer 1987-2002 (in millions)

Year[a]	Total	Percent Change In Total	Private Carriers	State Funds	Self-Insured	Federal	Medical	Percent Medical
1987	$27,317	11.0	$15,453	$4,084	$5,082	$2,698	$9,912	36.3
1988	$30,703	12.4	$17,512	$4,687	$5,744	$2,760	$11,507	37.5
1989	$34,316	11.8	$19,918	$5,205	$6,433	$2,760	$13,424	39.1
1990	$38,238	11.4	$22,222	$5,873	$7,249	$2,893	$15,187	39.7
1991	$42,169	10.3	$24,515	$6,713	$7,994	$2,998	$16,832	39.9
1992	$45,668	8.3	$25,280	$7,506	$9,724	$3,158	$18,664	40.9
1993	$45,668	-.7	$24,129	$7,400	$10,623	$3,178	$18,503	40.8
1994	$44,586	-1.6	$22,306	$7,587	$11,527	$3,166	$17,194	38.6
1995	$43,373	-2.7	$21,145	$7,893	$11,232	$3,103	$16,733	38.6
1996	$41,837	-3.5	$20,392	$7,603	$10,775	$3,066	$16,567	39.6
1997	$42,314	1.1	$21,645	$7,266	$10,623	$2,780	$17,306	40.9
1998	$43,278	2.3	$22,966	$7,241	$10,203	$2,868	$18,121	41.3
1999	$45,263	4.6	$24,632	$7,264	$10,504	$2,862	$19,316	42.1
2000	$47,621	5.2	$26,513	$7,449	$10,702	$2,957	$20,710	42.9
2001	$49,782	4.5	$27,274	$7,989	$11,439	$3,069	$22,207	44.6
2002	$53,443	7.4	$29,028	$9,385	$11,876	$3,154	$24,285	45.4

[a] Estimated benefits paid under deductible provisions are included beginning in 1992.

b In all years, federal benefits includes those paid under the Federal Employee's Compensation Act for civilian employees and the portion of the Black Lung Benefit Program that is financed by employers and are paid through the federal Black Lung Disability Trust Fund. In years before 1997, federal benefits also include the other part of the Black Lung program that is financed solely by federal funds. In 1997 -2002 federal benefit also include a portion of employer-financed benefits under the Longshore and Harbor Workers Compensation Act that are not reflected in state data namely, benefits paid by self -insured employers and by special funds under the LHWCA. See Appendix H for more information about federal programs.

From "Workers' Compensation: Benefits, Coverage, and Costs, 2002," by C.T. Williams, V.P. Reno, and J.F. Burton, 2004. *National Academy of Social Insurance,* Washington, DC. p. 12.

Table 2.3 Comparison of Workers' Compensation Benefits, Coverage and Costs, 2002-2003 Summary.

	2002	2003	Percent Change
Covered workers (in thousands)	125,603	125.16	-0.3
Covered Wages (in billions)	$4,624	$4,734	2.4
Workers' compensation benefits paid (in billions)	$53.2	$54.9	3.2
Medical benefits	$24.3	$25.6	5.2
Cash benefits	$28.8	$29.3	1.5
Employer costs for workers' compensation (in billions)	$73.7	$80.8	9.6
Amount per $100 of covered Wages			In amount
Benefits paid	$1.15	$1.16	0.01
Medical payments	$0.53	$0.54	0.01
Cash payments to workers	$0.62	$0.62	0.00
Employer costs	$1.59	$1.71	0.12

From "Workers' Compensation: Benefits, Coverage, and Costs, 2003," by I. Sengupta, V.P. Reno, and J.F. Burton, 2005. *National Academy of Social Insurance,* Washington, DC. p.2.

comparison of workers' compensation benefits by the number of covered workers, covered wages, medical and cash benefits. An estimated two percent (2%) of the industrial work force in the United States has a compensable back injury claim every year (Snook, 2004; Volinn, 1997; Behrens, Seligman, Cameron, Mathis, & Fine, 1994; Antonakes, 1981; Nordby, 1981). Volinn, Van Koevering, & Loeser, (1991) suggest that the majority of low-back claims are filed by persons between the ages of twenty (20) to forty (40) years of age. This finding is consistent with a large-scale study by Macdonald et al (1997) that investigated the demographic and cost differences between recurrent and non-recurrent low-back pain.

The health care and cash payments made to disabled workers in 2000 ($45.9 billion) through workers' compensation is second only to Social Security Disability

Insurance which paid $56.8 billion to disabled workers under age 65 in 2000 (National Academy of Social Insurance, 2002).

Murphy and Courtney (2000) investigated 107,867 low back claims reported to a large national insurer in 1992. Claim data were retrieved in 1995 to allow for a minimum two year claim maturity. Medical cost represented thirty-six percent (36%) and indemnity sixty percent (60%) with an additional four percent (4%) for non-administrative expenses. Industry sectors chosen for analysis consisted of the construction, durable manufacturing, non-durable manufacturing, manufacturing, retail, service, health services, trucking and wholesale industries. Seventy-six percent (76%) of claims occurred in these nine (9) sectors with the trucking (23.9%) and health service sectors (20.2%) having the highest portion of low back claims. Dworkin, Handlin, Richlin, Brand, & Vannuci (1985) reported that injured workers in the U.S. with pending litigation made greater use of medical services and incurred greater medical expense.

Low-back pain accounts for the majority of lost work days related to industrial accidents (Bureau of Labor Statistics, 2003). Fulton-Kehoe, Franklin, Weaver, & Cheadle (2000) found that back and neck sprains had the highest years of productivity lost (YPL) for compensable injuries filed in the state of Washington in 1986. Actual accumulated loss time was calculated at 14,624 years. Predicted lost productivity ranged from 28,017 – 33,502 years. The nature of the injury typically relates to sprain, strain, inflammation, rupture, hernia, fracture and contusion.

Indirect costs associated with low-back injury include administration, legal, loss of production, training and hiring to replace disabled workers (Brandt, 1999; Webster and Snook, 1990). Brandt (1999) estimates that indirect cost can range from two (2) to ten

(10) times the actual face value of a claim and an estimated forty percent (40%) of claims carry greater indirect cost than direct cost.

Prevalence of Back Pain

Chronic low-back pain has totally and permanently disabled over one percent (1%) of the United States population (Tollison, 1991). Low-back claims on average account for twenty percent (20%) of all workers' compensation claims and roughly thirty to forty percent (30% - 40%) of all claims cost (Von Korff et al, 1998; Hashemi, Webster, & Clancy, 1998; Hashemi, Webster, Clancy, & Volinn, 1997; Webster and Snook, 1994; Tollison, 1991; Webster and Snook, 1990; Bigos et al 1986; Spengler et al, 1986; Yu, Roht, Wise, Kilian, & Weir, 1984; Klein, Jensen, & Sanderson, 1984). It has been reported that the average cost of a low-back claim is routinely fifty percent (50%) higher than the average cost of all other work-related claims (Butler and Yong-Seung Park, 2000).

As early as 1979, an estimated $1 billion dollars was expended on treatment and compensation payments for sprains/strains of the back. This estimate was compiled from twenty-six (26) states participating in a federal-state cooperative (Supplementary Data System) designed to provide detailed information on injuries and illnesses (Klein, Jensen, & Sanderson, 1984).

Fordyce, Roberts, & Strenbach (1985) estimated a 2,680% increase in the rate of compensation for low-back pain between 1960 and 1980. Webster and Snook (1990) estimated the total compensable costs associated with low-back pain in 1986 at $11.1 billion and overall workers' compensation cost at $16.1 billion (Snook and Webster,

1987). This estimate was compiled from forty-five (45) states representing 98,999 claims. Eleven (11) years later, Leigh, Markowitz, Fahs, Shin, & Landrigan, (1997) estimated 1997 costs associated with the low-back to have a total impact of $171 billion. The incident rate in 1995 was 186.9:1000 (Straus, 2002).

Spengler et al (1986) conducted a retrospective study on 4,645 reported injuries at The Boeing Company in the state of Washington during 1979 – 1980 (15 month period). Back injuries accounted for nineteen percent (19%) of reported claims however accounted for forty-one percent (41%) of total injury cost; estimated at $1,800,000. Of the nine hundred (900) back claims, ten percent (10%) of these claims represented seventy-nine percent (79%) of the $1,800,000 or roughly $1,422,000. The percentage of back claims exceeding $10,000 in total claims cost (6.5%) was significantly higher than the percentage of claims (1.5%) unrelated to back injuries ($p = 0.000$).

This section of the literature review has established that a considerable body of research exists on the costs of low-back pain in industry. The following section examines the primary data sources and demographic variables examined to determine which variables improve the capacity to predict the final permanent partial disability rating.

Research and Literature Related in Methodology

Objective of Workers' Compensation Benefit Structure

The initial intent of workers' compensation was to provide an insurance system that would provide benefits to workers who were injured in the course and scope of employment (The Report of The National Commission on State Workmen's

Compensation Laws, 1972). Benefits are to include medical treatment for work-related conditions and income support to replace lost wages during the recovery period (National Academy of Social Insurance, 2004). If the end-result of the injury limited the capacity to perform activities of daily living (ADL) that would be expected by a generally accepted standard and/or was determined to be permanent but only partial then permanent partial disability (PPD) benefits are paid (World Health Organization, 2000).

Impairment Rating Schedules

Disability or more specifically impairment ratings are used in a majority of the state's to determine permanent partial disability (PPD) benefits for injured workers (Butler and Yong-Seung Park, 2000). "Impairment is a purely medical condition; it is any anatomic or functional abnormality or loss. Disability is not a purely medical condition..." (The Report of The National Commission on Workmen's Compensation Laws, 1972). A fundamental concept used by the administrative systems in the United States is the use of "schedules of disability". The majority of these schedules begin with a description of impairments related to a specific body part or body systems. The scale ranges from 0% - 100%. A percent number assigned to a particular body part or body system represents a percent of disability which translates the relative severity into compensation levels (Reville, Neuhauser, Bhattacharya, & Martin, 2002) and in Tennessee's system; loss of earning power and ability to compete in the open labor market.

Permanent Partial Disability Benefits

Permanent partial disability (PPD) benefits involve cash wage-replacement benefits and are paid to workers with consequences of their injuries after reaching maximum medical improvement (MMI) (National Academy of Social Insurance, 2002). The disability must be permanent but not preclude the ability to work.

Methods for determining whether an employee is entitled to permanent partial disability (PPD) benefits are comprehensive and vary among states. These determinations are made taking into account geographical area, educational background, prior work experience, employment opportunities and economic factors present in the community in which the worker lives (Barth and Niss, 1999).

Association Between Impairment and Permanent Partial Disability Awards

A study by Boden (1997) examined the relationship between physician impairment ratings and disability awards for comparable injuries to find out how awards varied among Tennessee's thirty-one (31) judicial districts. Boden (1997) examined 831 injury claims from 1990 and 1992. Data was obtained from eight (8) large insurance carriers doing business in Tennessee representing fifty-one percent (51%) of the workers' compensation insurance market. Additional data was provided by self-insured employers representing twelve percent (12%) of the sample in both years and nine percent (9%) of the insurance market. Cost estimates were 2.5 years post-injury.[7]

[7] For consistency in claim maturity only claims that were settled within 2.5 years from date of injury were analyzed.

The measurement used was the final permanent partial disability percentage. This was done to provide a comparable basis among settlements. Physician impairment ratings were available in 768 of 831 claims analyzed. Primary factors used in the statistical analysis were: (1) last treating physician impairment rating; (2) whether the injured worker returned to work or not (1992 claims only); (3) length of temporary disability; (4) age; (5) resolution process (settled or adjudicated); (6) judicial districts; and (7) nature of the injury.

To further simplify comparisons among claims a model of a "typical injured worker" was utilized. This worker was thirty-eight (38) years of age with a back injury claim resulting in twenty (20) weeks of lost time. The worker returned-to-work for the pre-injury employer and received a seven percent (7%) permanent impairment rating from the treating physician. The weekly compensation rate used for statistical analysis was $200 per week which converts to $800 per percentage point of impairment.[8]

The results of the study found that benefits varied for similar injuries among Tennessee's thirty-one (31) judicial districts. Variation in benefits ranged from a low of $6,700 to a high of $38,500 with the median district paying $15,800. Therefore, the typical injured worker in one of the lower paying districts could expect to receive about three-fourths (¾) of the benefits to the same typical injured worker in one of the higher paying districts. A statistically significant difference between 1990 and 1992 claims was found for adjudicated body-as-a-whole claims. No measurable change was found for settled claims.

[8] Tennessee pays 4 weeks of benefits for each percentage point of impairment for non-scheduled injuries. Therefore, 1% of 400 weeks (maximum number of weeks) equals 4 weeks of benefits.

Association Between Method of Settlement and Overall Claim Costs.

Wood, Morrison and Macdonald (1993) examined the effects of settlement method in Western Australia. Similar to the United States, Western Australia requires employers to have insurance to cover their liability in the event of a workplace injury. Injured workers are entitled to both medical and weekly benefits.[9] In a previous study on Australia; Morrison, Wood, and Macdonald (1992) found that 69.7% of reported claims resulted in benefits being paid for a period of time three days or less.

Injured workers in Western Australia are entitled to a lump sum payment under the following:

(1) "Lump Sum Redemption: either full or partial recovery obtained, claim not finalized in the event of a recurrence;

(2) Prescribed Lump Sum: claim duration six (6) months or longer, injury has resulted in loss of member/organ with permanent disability, awards are based on a schedule specific to the injury;

(3) Common Law Settlement: injury due to employer negligence, right to sue and seek damages at common law including pecuniary and non-pecuniary damages" (Wood, Morrison, and Macdonald, 1993).

The database contained 42,000 workers' compensation claims finalized in 1990 from both private and government agencies. From this a sample of 8,232 claims were selected according to three (3) disability categories; (1) no disability, (2) partial disability and (3) total permanent disability. The sample provided 584 (7.1%) claims settled by

[9] The author's note that variation exist across Australia in how entitlements are paid to injured workers.

lump sum payments. One hundred and ninety-eight (198) claims were settled by lump sum redemption, 197 by prescribed lump sum and 189 claims by lump sum payment following litigation. The balance of remaining claims involved full recovery and these claims were closed without remedy of lump sum settlement. The cost model was estimated by ordinary least squares. The dependent variable equaled the sum of case expenditures: weekly compensation, lump sum payments, medical expense, rehabilitation expense and legal costs. Twenty-two (22) independent variables were added to the model, two were continuous. Table 2.4 illustrates the independent variables.

The results of the analysis found that for a given claim duration method of settlement had the greatest impact on claim cost. Common law settlements are estimated to cost four (4) times more than claims closed without settlement. Prescribed lump sum and lump sum redemption also had a profound effect on overall claim costs. Socioeconomic, demographic, employment security and medical condition variables differed in magnitude. For example, age was reported to be statistically significant while gender and blue collar occupations exhibited negative coefficients. Table 2.5 illustrates the relative change in costs. To assist the reader in understanding the coefficient estimate consider the variable age; a 10% increase in age results in a 2.2% increase in total claim costs. The results of this study suggest that the method by which claims are resolved in Western Australia influence overall claim costs and musculoskeletal injuries among older males are also associated with greater overall claim cost.

Table 2.4 Independent Variables & Summary Statistics for the Cost Regression Model[a]

Variable	Cost Coefficient	t – Statistic
Constant	4.21	(46.66)
Total disability	0.36	(1.28)
Partial disability	0.14	(2.31)**
Hospital status	0.31	(20.51)*
Back/neck	0.12	(2.53)**
Sprains/strains	0.13	(5.08)*
Fracture	0.08	(2.55)*
Amputation	0.43	(3.48)*
Managers and administrators	0.14	(2.05)**
Professionals	0.21	(5.23)*
Para-professionals	0.11	(2.65)*
Tradespersons	-0.03	(0.90)
Clerks	0.05	(1.20)
Machine operators	-0.04	(1.14)
Laborers	-0.07	(2.08)**
Age	0.22	(10.26)*
Martial status	0.06	(4.22)*
Gender	-0.18	(10.59)*
Common law settlement	1.39	(30.56)*
Prescribed lump sum	1.00	(22.95)*
Lump sum redemption	0.32	(7.04)*
Claim duration	0.79	(148.30)*
R^2	0.872	
F	1650.25*	

[a] The number of observations is 8232. Absolute t-statistics are in parenthesis. The categories omitted from the dummy variables processes are: male; single person; no permanent disability; salesperson; eye injury; open wound; no hospital treatment; no lump sum payment.

*p < .01

**p < .05

From "Factors Influencing the Cost of Workers' Compensation Claims: The Effects of Settlement Method, Injury Characteristics, and Demographics" by Wood, Morrison, & Macdonald, 1993. *Journal of Occupational Rehabilitation, 3*(4), 208.

Table 2.5 The Relative Change in Costs with Respect to Dichotomous Variables (percent)[a]

	Relative change percent
Common law settlement	301.5
Prescribed lump sum	171.8
Amputation	53.7
Lump sum redemption	37.7
Hospital status	36.3
Professional	23.4
Gender	-19.7
Partial disability	15.0
Managers and administrators	15.0
Sprains/strains	13.9
Back/neck	12.7
Para-professionals	11.6
Fractures	8.3
Laborers	-7.3
Marital status	6.2

[a] The estimate of the coefficient for a dichotomous variable in a logarithmic functional form yields the relative change in the logarithm of total costs. To convert this value into the percentage change in total claim costs we employ the formula $(e^{\beta} - 1), 100$, where β is the estimated dummy coefficient.

From "Factors Influencing the Cost of Workers' Compensation Claims: The Effects of Settlement Method, Injury Characteristics, and Demographics" by Wood, Morrison, & Macdonald, 1993. *Journal of Occupational Rehabilitation, 3*(4), 209.

Research and Literature Related in Methodology and Content

Permanent Partial Disability Benefits

Apart from the variation in the structure and benefits of state workers' compensation systems the costs associated with permanent partial disability (PPD) benefits are of common concern. Permanent partial disability (PPD) claims represent sixty percent (60%) of all benefit costs and average $49,000 per claim (National Council on Compensated Insurance, 2002). An analysis of published studies suggest that low-back claims represent a significant portion of total claims costs. The majority of the information on low-back claims comes from insurance statistics.

Nonspecific Back Injuries

Federspiel, Guy, Kane, & Spengler (1989) reported on 29,421 workers' compensation claims that were closed in 1986 in Tennessee.[10] The study identified $160 million paid in claims. Ninety-six ($96) million was paid (60%) in compensation benefits with the remaining $64 million paid (40%) for medical benefits. Of the 29,421 closed claims twenty-seven percent (27%) involved back injuries. Strains/sprains represented forty-two percent (42%) of the back injury claims and seven percent (7%) were classified as "not classifiable." Ninety-one percent (91%) of back claims were nonspecific injuries totaling $48.9 million compared to $6.9 million for specific back injuries. Mean case cost was estimated at $7,000.

[10] Eighty percent (80%) of these claims had injury dates between 1983– 1985. Thirty-seven percent (37%) occurred before 1980 with three percent (3%) occurring in 1986.

Demographics

Age

Epidemiological studies have been unable to establish that older workers have greater frequency and severity of low-back pain when performing same tasks as younger workers (Gluck and Oleinick, 1998). Recovery rates among older workers have been shown to be slower compared to younger workers (Gluck and Oleinick, 1998; McIntosh, Frank, Hogg-Johnson, Bombardier, & Hall, 2000) and the number of medical visits increases incrementally with age (Wright, Mayer, & Gatchel, 1999).

A number of studies have demonstrated that the majority of low-back claims occur in individuals in their thirties and forties (Rowe, 1969; Levitt, Johnson, & Beyer, 1971; Kertesz and Kormos, 1976; Snook, Campanelli, & Hart, 1978; Afacan, 1982). Studies investigating the relationship between age and receipt of workers' compensation benefits are inconclusive (Burton and Spieler, 2001). An article published by the Workers' Compensation Research Institute (Tattrie, Gotz, & Te-Chun Liu, 2000) suggests that an aging workforce from 1995 through 2020 will have a negligible impact on overall workers' compensation costs. This report acknowledges the fact that the number of older workers is expected to double between 1995 and 2020. The study also reported that the lower claim frequency of older workers is offset by their higher costs per claim.

Older workers are more likely to receive permanent partial disability (PPD) benefits (National Academy of Social Insurance, 2003). Older workers typically have greater earning losses during recovery and are less likely to be reemployed in the job market after injury (Burton and Spieler, 2001; National Academy of Social Insurance,

2003). Subsequently, older workers have greater impairment ratings for their injuries and suffer greater consequences as a result of a workplace injury (National Academy of Social Insurance, 2003). Arguably, for older workers it is often difficult to determine the degree to which a condition is directly related to the work environment or a matter and consequence of the aging process and life style choices.

Education

The impact of formal education for injured workers with low-back claims have been referred to as being inversely related (Croft and Rigby, 1994; Viikari-Juntura et al, 1991; Leigh and Sheetz, 1989; Bergenudd and Nilsson, 1988; Cunningham and Kelsey, 1984) and an indicator of back-related disability (Badley and Ibanez, 1994; Deyo and Diehl, 1988; Cunningham and Kelsey, 1984).

A study by Dionne et al (1995) examined the association of education and back-related disability using four sets of variables to explain the relationship. Variable sets included: (1) clinical, behavioral and environmental; (2) occupational; (3) health care use; and (4) interactions among stress and coping strategies. Subjects were enrollees of an HMO who sought medical treatment for back-related pain during 1989 – 1990. Subjects were interviewed at baseline with follow-up evaluation at one and two years using a modified version of the Roland-Morris Scale to measure disability.

Subjects were divided by formal education (≤ 12 and > 12) that were compared or selected characteristics using Chi-square or Fisher-Irwin exact tests for categorical variables and Student t Test or Wilcoxon Rank Sum test for continuous variables. Over

all, sixty-four (64) variables were measured for influence on an association between education and disability.

Results of the study indicated that subjects with at least thirteen (13) years of education had less disability and a reduced amount of disability over time when compared with subjects with less education. Both occupational and psychological characteristics were viewed as primary explanations for the difference in observed back-related disability among subjects with differing levels of education.

Blackwell, Leierer, Haupt, & Kampotsis (2003) examined which variables improved the capacity to return-to-work (RTW) after injury. Predictor variables included age, pre-injury education, attorney involvement, mandatory vocational rehabilitation and time from injury to referral. The retrospective study consisted of five hundred and two (502) workers in Montana receiving workers' compensation benefits under the State Compensation Insurance Fund (SCIF).

Multiple logistic regression analysis was used to develop a predictive model for return-to-work (RTW). Significance level was set at ($\phi < .001$). Only one ratio variable in the model was shown to have a significant relationship with return-to-work (RTW); years of education ($r = .20$, $\rho < .0001$).

Weekly Compensation Benefits

Direct cost of a workers' compensation claim include medical payments, compensation for lost wages during recovery and either permanent partial or permanent total disability payments (Webster and Snook, 1990). Disbursement of weekly benefits varies by state and few studies have assessed mean or median weekly benefits.

Volinn, Van Koevering, & Loeser (1991) examined the effects of socioeconomic factors on chronicity[11] as it related to back sprain. The data consisted of 18,372 men and 6,721 women with compensable insurance claims in the state of Washington in 1984. Ninety-three percent (93%) of all back claims in 1984 were for back sprain. The base wage replacement for the study period was sixty percent (60%) of what the injured worker earned at time of injury. Analysis consisted of Chi-square tests and with the exception of occupation for women, all relationships were significant at the $\rho \leq .01$ level. Socioeconomic factors were implicated in the illness of chronic back pain. More specifically, in relation to short-term disability claimants with a monthly wage less than $1,000 were found to be twice the risk compared to claimants earning more than $2,000 a month.

Surgery

Of particular interest in the majority of the research are intervention studies that compare outcomes of interventions on like populations. Eccleston and Zhao (2005) reported that two-thirds of Tennessee workers with a workers' compensation claim involving low-back neuropathic back disorders had back surgery during 2001 – 2003. Other researchers have reported details on recovery rates, return-to-work outcomes and financial costs. The majority of studies on industrial disability suggest that compensation reinforces pain (Leavitt, 1992).

Few studies take into account the factors associated with return-to-work outcomes and the physical demands of the job when comparing compensated and non-compensated

[11] Chronicity is defined as ninety (90) or more days away from work.

groups (Leavitt, 1992). In a study comparing workers injured on the job opposed to workers injured away from work on variables of disability Leavitt (1992) suggest that injury on the job operates both independently and interactively with physical demand levels to extend the period of disability. Therefore, injury on the job is more likely associated with prolonged disability irrespective of the type of work performed. No studies were found that investigate higher disability awards for back injuries based on whether or not surgery was performed.

Length of Disability

There is a divergence among studies reporting on receipt of workers' compensation and recovery rates among the injured. It is generally perceived that the longer the duration of disability the less likely a meaningful return-to-work (RTW) will ever occur (Krause, Dasinger, & Neuhauser, 1998). Sander and Meyers (1986) found that railroad workers with a compensable low-back injury took significantly longer periods of recovery than railroad workers with non-compensable claims. These findings are similar to a retrospective cohort study by Greenough and Fraser (1989) who reported compensated patients recovering from a low back injury showed greater psychological disturbance and longer periods of absence compared to a matched non-compensated group. Tomaras, Blacklock, Parker, & Harper (1997) in a retrospective study of cervical radiculopathy patients reported that the mean period of work absence was 2.9 weeks for non-compensated patients compared to 7.6 weeks for compensated patients.

In contrast, Hadler, Carey & Garrett (1995) reported no difference in work absence among compensated and non-compensated patients once the injured worker

sought medical treatment. Robinson, Rondinelli, Scheer, & Weinstein (1997) found no statistical significance between compensated and non-compensated patients regarding outcomes of a rehabilitation program for patients suffering from chronic low back pain. These findings are similar to Rainville, Sobel, Hatigan, & Wright (1997) where no difference was found between compensated and non-compensated patients involved in an aggressive rehabilitation program for chronic low-back pain.

Notwithstanding the divergence among published research regarding recovery outcomes among compensated and non-compensated groups, sprains and strains involving the back accounted for forty-three percent (43%) of days away from work in 2002 (Bureau of Labor Statistics, 2003). Robinson, Rondinelli, Scheer, & Weinstein (1997) predicted that injured workers with chronic low-back pain have a 1:4 chance of returning to work within twelve (12) months of injury compared to 1:10 twenty-four (24) months post-injury.

Physical Impairment

There are two types of permanent impairments: scheduled and unscheduled. A scheduled injury is to a specific body part while an unscheduled injury is generally related to the body-as-a-whole. Baldwin, Cote, Frank, & Johnson (2001) describe impairment as *"A physiological or anatomical loss or other abnormality. Impairment may or may not cause a functional limitation."* Impairments ratings should not be used for conclusive determinants of an injured workers ability to work (American Medical Association, 2001).

The World Health Organization (1980) describes impairment as an anatomic defect at the level of the organ system. The workers' compensation system is concerned with impairments that limit a workers ability to perform work (Baldwin, Cote, Frank, & Johnson, 2001). The extent to which the ability to work is affected is dependent on the physical demands of the job (Barron, 2001; Halpern, 2001). Physicians are charged with the role of determining medical impairment. Methods for the determination and identification of low back impairment are imperfect and infer uncertainty in the prediction of functional outcome (Barron, 2001; Halpern, 2001; Scheer and Weinstein, 1992; Scheer and Wickstrom, 1991). The most recognized methodology for the evaluation of permanent impairment is the American Medical Association Guides to the Evaluation of Permanent Impairment (Langworthy, 1993).

Under the workers' compensation system a physician's determination of physical impairment is the starting point of permanent partial disability (PPD) and at the center of providing evidence that wage loss is due to the injury. It is not uncommon to have a second physician provide an independent medical evaluation (IME) and a subjective rating that moves the impairment to a higher rating and/or from one location of the body to another (Gice, 1994). Consequently, compromised claims often involve difference of opinion about the degree of medical impairment (Boden and Galizzi, 1999).

Vocational Disability

When an injury has a permanent effect then workers' compensation programs generally allow for compensation to be paid for the future loss of earning capacity and is often referred to as a "vocational disability". The underlying theory behind vocational

disability focuses on the concept that an employee may have been eligible and competent to work in other job capacities prior to injury. However, given the nature of the injury and any permanent medical restrictions the injured employee's future employment opportunities are likely limited (Lype, 2003).

The term "disability" often refers to an injured workers ability to perform specific activities and should not be used interchangeably with "impairment" (Barron, 2001). Vocational disability ratings and impairment ratings are two different measurements (Lype, 2003).

According to the American Medical Associations Guides to the Evaluation of Permanent Impairment, 5th Edition (2001) there is several scales that measure disability. Impairment ratings reflect the severity and limitations of a given injury for an organ/body system (American Medical Association, 2001). The Guides provide three (3) tables to evaluate impairment for back related injuries: (1) Lumbar Spine; (2) Thoracic Spine; and (3) Cervical Spine. Figure 2.1 stratifies disability in terms of degree and permanency (Barron, 2001).

There are many definitions of disability and each state maintains its own classification and structure however the process of determination focuses on two key characteristics of disability: degree and length of disability (Barron, 2001). Disparities among system costs across states are a direct result of the variances in formulas and administrative processes used to determine the amount of permanent partial disability (PPD) benefits (Gice, 1994). Therefore, comparisons among state systems are extremely complex (Ballantyne, 2003).

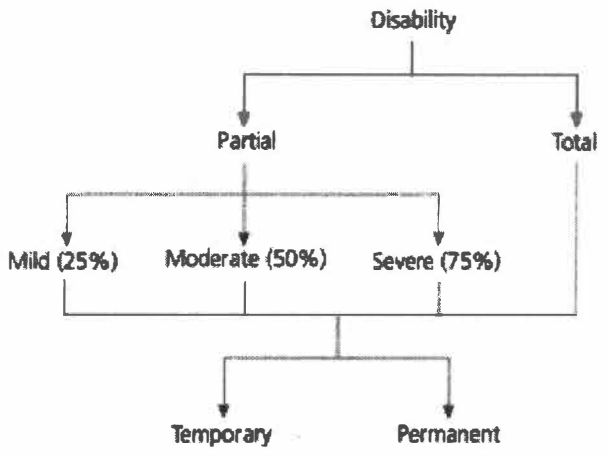

Figure 2.1 Disability Classification

From "Disability Certifications in Adult Workers: A Practical Approach" by B.A. Barron, (2001). *American Family Physician, 64*(9), 1579-1586.

Summary

The purpose of this chapter was to review related literature focusing on compensable back injury claims and variation in the structure and cost of permanent partial disability (PPD) indemnity benefits. In addition, the literature search compiled a list of the data sources used in analysis and the type of variables investigated to determine which variables improve the capacity to predict permanent partial disability (PPD) indemnity benefit outcomes.

Previous published studies have examined the costs associated with low back claims (Leavitt, Johnston, & Beyer, 1971; Antonakes, 1981; Klein, Jensen, & Sanderson, 1984; Spengler et al 1986; Snook and Webster, 1987; Webster and Snook, 1990;

Tollison, 1991; Webster and Snook, 1994; Hashemi, Webster, Clancy, & Volinn, 1997; Hashemi, Webster, & Clancy, 1998; Williams, Feuerstein, Durbin, & Pezzullo, 1998; Murphy and Courtney, 2000; Fulton-Kehoe, Franklin, Weaver, & Cheadle, 2000) while other studies investigated the increase in the rate of compensation (Fordyce, Roberts, & Strenbach, 1985), demographic factors (Butler and Yong-Seung Park; 2000, Barth and Niss, 1999) and relationship between impairment and disability awards (Boden, 1997).

There is a growing body of literature advocating that the greater economic burden that results from a work-related injury is borne heavily by the injured worker (Miller and Galbraith, 1995; Leigh, Markowitz, Fahs, Shins, & Landrigan, 1997; Biddle, Roberts, Rosenman, & Welch 1998; Boden and Galizzi, 1999; Reville, 1999; Reville, Bhattachatya, & Sager-Weinstein, 2001; Boden, Biddle, and Spieler, 2001; Biddle. Boden, & Reville, 2001; Weil, 2001) and is a direct consequence of disability duration or permanent physical disability (Boden, Biddle, & Spieler, 2001).

Back claims occur more often than any other type of work-related injury and typically represent the lion's share of workers' compensation costs (Baldwin, Cote, Frank, & Johnson, 2001). Few studies have investigated the percent of vocational disability applied to permanent partial disability (PPD) awards. Moreover, few studies have investigated how these awards vary across state geographic area, demographic characteristics and return-to-work status after injury. Consequently, any investigation measuring workers' compensation benefit adequacy within a given system must address the complex question of policy issues within a given system and quantification of degree to which an individual is vocationally disabled (Hunt, 2002).

CHAPTER III

METHODOLOGY

This chapter describes the research design, the Statistical Data Form (SD-1), the research methodology and data analysis procedures used in the research study. The population consists of Tennessee workers' compensation claims reported as closed in calendar years 2000 – 2003 through the filing of a Statistical Data Form (SD-1) with the Tennessee Department of Labor and Workforce Development.

Purpose of the Study

The purpose of this study was to investigate the relationship between the permanent partial disability multiplier (PPDM) for back injuries and the settlement method used (settlement approved by court - complaint filed; settlement approved by court - complaint not filed; settlement Tennessee Department of Labor; and trial) to reach a permanent partial disability (PPD) award.

Research Design

The research design for this study assessed selected independent variables arranged into three categories: (1) demographic; (2) socioeconomic; and (3) injury characteristics. This approach makes good use of already existing data. The study utilized data made possible by Tennessee Code Annotated §50-6-244 which establishes a method by which workers' compensation data specific to each Tennessee claim is reported to the Department of Labor and Workforce Development Division in Nashville.

The research was designed to assess the demographic variables consisting of age, education level, TN county of injury, judicial district, geographic region and year of injury. Socioeconomic variables consisted of average weekly wage and compensation (benefit) rate. Injury characteristics consisted of date of injury, days to maximum medical improvement, treating physician impairment rating, independent medical examination employee, independent medical examination employer, number of days lost, permanent partial disability multiplier, permanent partial disability percentage, settlement method and surgery. This framework of variables was selected as the literature review found these variables to be influential in assessing permanent partial disability (PPD) benefits.

Statistical Data Form

Tennessee Code Annotated §50-6-224 requires the parties involved in a workers' compensation claim to complete and file a Statistical Data Form (SD-1) with a final court order or if the settlement is approved by the Department of Labor and Workforce Development.

The information from each Statistical Data Form (SD-1) is entered into the Tennessee workers' compensation computer system (WCS). It is from this data base that the research data were extracted, coded and entered into one computerized database. Individual claim data is dependent upon the extent the Statistical Data Form (SD-1) is completed. No individual employee names or identification numbers were used in the results generated for data analysis.

Variable Parameter Model

The Statistical Data Form (SD-1) collects data on closed workers' compensation claims. To identify characteristics of tried or settled claims fifteen (15) variables were entered into the data base from the Statistical Data Form (SD-1). The selected variables impact disability ratings (Boden, 1997). Table 3.1 illustrates the variables extracted and coded into the data base. Specific variables were recoded in the following manner.

Able to Return-to-Work

Tennessee incorporates a two-tier system for unscheduled injuries (T.C.A. §50-6-241) therefore the variable "able to return-to-work" was divided into two groups: (1) employees that return-to-work (RTW) and (2) employees that did not return-to-work (NRTW). The statute requires that the pre-injury employer return the employee to employment at a wage equal to or greater at the time of injury in order to cap a permanent partial disability (PPD) award at 2 ½ times the medical impairment rating. No instrument was available to determine if the injured employee returned to their specific pre-injury job. It can only be stated that the employee returned to work. Employees that did not return-to-work by statute are capped at six (6) times the medical impairment rating. Able to return-to-work information was missing from 1,193 claims therefore these claims were excluded from final data analysis. Figure 3.1 illustrates Tennessee's two-tier system.

Age

The variable age was recoded into five age groups: (1) age 24 or less; (2) 25-34; (3) 35-44; (4) 45-44; and (5) 55 – to highest.

Table 3.1

Variables Extracted from the Statistical Data Form (SD-1) and Coded into the Database

	Number	Missing
Able to Return-to-Work	5205	1193
Age	6398	0
Average Weekly Wage	6234	164
Compensation Rate	6234	164
Date of Injury	6342	56
Day to Maximum Medical Improvement	6362	36
Impairment Rating	6398	0
Independent Medical Examination Employee	1355	-
Independent Medical Examination Employer	175	-
Number of Days Lost	5627	-
Permanent Partial Disability Percentage	6398	0
Settlement Method	6398	0
Surgery	6189	209
Tennessee County of Injury	6398	0
Year of Injury	6398	0

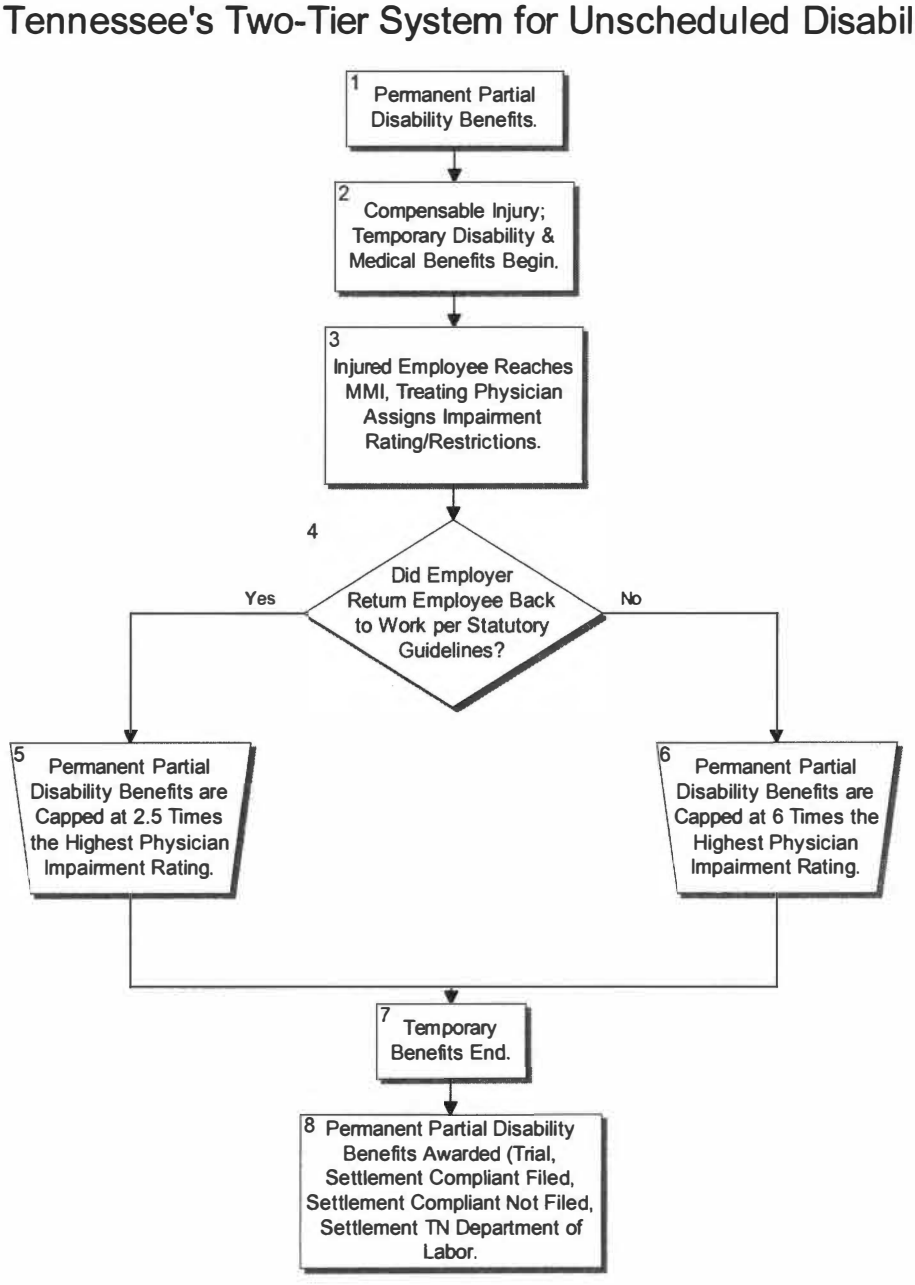

Figure 3.1 Tennessee's Two-Tier System for Unscheduled Benefits

Education Level

Education level was recoded into two groups: (1) education less than high school or GED; and (2) education greater than high school (Dionne et al, 1995). Education less than high school consisted of: less than 9th grade, some high school and GED. Education greater than high school consisted of: some college, BS/BA and graduate degree. Individuals with a high school diploma were used as the comparative group.

Impairment Rating

Multiple physician impairment ratings were present on the Statistical Data Form (SD-1). When applicable these impairment ratings were averaged together and then the average impairment rating was entered into the cell.

Independent Medical Examination

When a claim had both an employee independent medical examination (IME) and an employer independent medical examination (IME) these impairment ratings were averaged then entered into the cell. The employee independent medical examination (IME) and the employer independent medical examination (IME) were merged together to form one independent medical examination (IME) variable.

Permanent Partial Disability Percentage

The permanent partial disability percentage is the final percentage rating associated with a work-related injury. It is based on the award as a percent of 400 weeks

of benefits.[12] When the permanent partial disability percentage was less than one (1%) the percentage was rounded to one percent (1%) and entered into the cell.

Settlement Method

The settlement method "Complaint Voluntary Dismissal" is listed as an option on the Statistical Data Form (SD-1). Knoxville staff attorney Lisa Knott advised that these claims are settled at the Tennessee Department of Labor and therefore was merged (110 claims) into the variable Settlement Tennessee Department of Labor.

Tennessee County of Injury

Tennessee's ninety-four (94) counties were recoded into thirty-one (31) judicial districts and then the counties were recoded into three (3) geographic regions (East, Middle and West). Table 3.2 illustrates the organization of Tennessee counties into judicial districts. Figure 3.2 illustrates a graphical representation of Tennessee counties. Table 3.3 illustrates the organization of Tennessee counties into geographic regions.

Population

The population chosen for this research study included back claims that were reported as closed in calendar years 2000 – 2003 through the filing of a Statistical Data Form (SD-1) with the Tennessee Department of Labor and Workforce Development.

[12] For example, an injured worker with a 10% impairment rating receives an award of 40% of 400 weeks of benefits. The final permanent partial disability rating associated with the injury is 40%.

Table 3.2 Tennessee 31 Judicial Districts

Tennessee Judicial Districts	Counties in District
District 1	Carter, Johnson, Unicoi, Washington
District 2	Sullivan
District 3	Greene, Hamblen, Hancock, Hawkins
District 4	Cocke, Grainger, Jefferson, Sevier
District 5	Blount
District 6	Knox
District 7	Anderson
District 8	Campbell, Claiborne, Fentress, Scott, Union
District 9	Loudon, Meigs, Morgan, Roane
District 10	Bradley, McMinn, Monroe, Polk
District 11	Hamilton
District 12	Bledsoe, Franklin, Grundy, Marion, Rhea, Sequatchie
District 13	Clay, Cumberland, De Kalb, Overton, Pickett, Putnam, White
District 14	Coffee
District 15	Jackson, Macon, Smith, Trousdale, Wilson
District 16	Cannon, Rutherford
District 17	Bedford, Lincoln, Marshall, Moore
District 18	Sumner
District 19	Montgomery, Robertson
District 20	Davidson
District 21	Hickman, Lewis, Perry, Williamson
District 22	Giles, Hardin, Lawrence, Maury, Wayne
District 23	Cheatham, Dickson, Houston, Humphreys, Stewart
District 24	Benton, Carroll, Decatur, Henry
District 25	Fayette, Hardeman, Lauderdale, McNairy, Tipton
District 26	Chester, Henderson, Madison
District 27	Obion, Weakley
District 28	Crockett, Gibson, Haywood
District 29	Dyer, Lake
District 30	Shelby
District 31	Van Buren, Warren

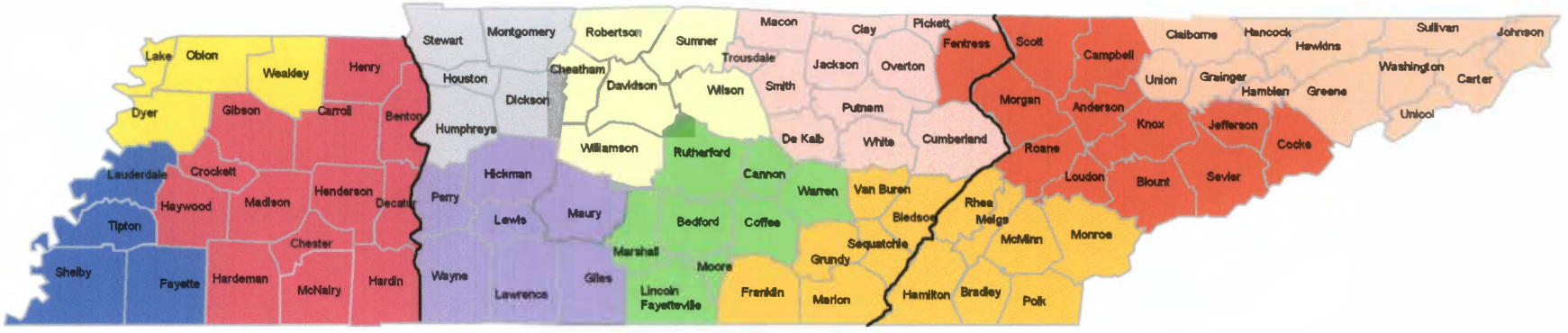

Figure 3.2 **Graphic Illustration of Tennessee Counties**

Table 3.3 Tennessee Counties Arranged into Geographic Region

Geographic Region	Tennessee Counties
East	Anderson, Blount, Bradley, Campbell, Carter, Claiborne, Cocke, Grainger, Greene, Hamblen, Hancock, Hawkins, Jefferson, Johnson, Knox, Loudon, Meigs, McMinn, Monroe, Morgan, Polk, Rhea, Roane, Scott, Sevier, Sullivan, Unicoi, Union, Washington
Middle	Bedford, Bledsoe, Cannon, Cheatham, Clay, Cumberland, Davidson, De Kalb, Dickson, Fentress, Franklin, Giles, Grundy, Hardin, Hickman, Houston, Humphreys, Jackson, Lawrence, Lewis, Lincoln, Macon, Marion, Marshall, Maury, Montgomery, Moore, Overton, Perry, Pickett, Putnam, Robertson, Rutherford, Sequatchie, Smith, Stewart, Sumner, Trousdale, Van Buren, Warren, Wayne, White, Williamson, Wilson
West	Benton, Carroll, Chester, Crockett, Decatur, Dyer, Fayette, Gibson, Hardeman, Haywood, Henderson, Henry, Lake, Lauderdale, Madison, McNairy, Obion, Shelby, Tipton, Weakley

Statistics

Statistical Analysis

The group data were analyzed using the Statistical Program for Social Sciences (SPSS) version 13.0. The data were first tabulated and analyzed using descriptive statistics (mean, frequency and percentages). The variables of interest included age, education, compensation rate, nature of injury, surgery, days to maximum medical improvement (MMI), treating physician impairment rating (tp), independent medical examination (IME) and the interaction of the treating physician impairment rating (tp^2).[13] Table 3.4 illustrates the constant variables used in the regression analysis.

[13] The treating physician impairment rating (tp) does not have a pure linear affect and was taking into account in the regression analysis. The affect of the treating physician impairment rating should flatten out as it increases (quadratic relationship). Putting tp^2 into the model helps to account for this curved relationship.

Table 3.4

Constant Variables Used In Regression Analysis

	Number	Missing
Age	6398	0
Compensation Rate	6342	56
Days to Maximum Medical Improvement	6362	36
Education > than High School	6398	0
Education < than High School	6398	0
Impairment Rating	6398	0
Interaction Treating Physician Impairment Rating	6302	-
Independent Medical Examination	6398	0
Strain/Sprain	6398	0
Surgery (Yes/No)	6189	209

Regression Analysis

The study analyzed the population of employees who settled a workers' compensation claim with the body part identified as back injury during the years 2000 – 2003. Regression analysis has been a central technique used in the study of economic statistics and has been equally important to the legal community and policy makers (Fisher, 1980). The parametric test performed in the study was regression.

The design of the analysis is prediction of the permanent partial disability multiplier (PPDM) from the average treating physician(s) impairment rating(s) as listed on each Statistical Data Form (SD-1). The prediction equation can be written as: $Y_i = \beta o + \beta x_1 + \beta x_2 + \ldots + \beta x_n + \varepsilon_i$. Regression was used to determine whether there was a significant difference between the group means using a p value of .05 (Maxwell & Delaney, 2000).

Data Set

A data set was received from the Tennessee Department of Labor Workers' Compensation Division in June 2005. The data were labeled by calendar year (2000 – 2003) and examined for consistency and quality. Typographic errors were corrected and checked against the state system. Duplicate claims were merged together. Missing data was checked against the state's workers' compensation system by querying Statistical Data Forms (SD-1) by date of injury and date of birth. Missing data were recorded from the Statistical Data Form (SD-1) into the database. Some missing data was determined by simple mathematical calculations. For instance, in cases where the average weekly wage (AWW) was present but not the compensation rate the average weekly wage was

multiplied by .6667[14] and the compensation rate was entered into the cell. In cases where the county of injury was missing however the zip code of the injured employee's residence was available the zip code was searched and the appropriate county was entered into the cell. In cases where the treating physician impairment rating was missing the rating was assumed to be zero and entered into the cell. In cases where the missing information was not available in the state system the cell was left blank.

Previous published studies (Gardner, Telles, & Moss, 1996; Boden, 1997) elected to use claim-level data collected from employers and/or insurers and analyze claims of the same maturity date. This research approach is often used to keep different data sets comparable. The database was not delimited by maturity date.[15]

Storage and Security

All data entry from the Tennessee Department of Labor records was completed at a secure office at the Knoxville Department of Labor Workers' Compensation Division. All records and other documents were kept in a locked office while coding the data. The computerized database created for analysis contained no names or identification numbers of individuals. All information was analyzed as group data.

Typical Injured Employee

In order to make straightforward comparisons among the various research objectives a model of the typical injured employee (Boden, 1997) in Tennessee was

[14] Tennessee pays benefits at 66 2/3 the average weekly wage. Weekly maximum and minimum amounts are adjusted annually.

[15] In other words, the authors of previous studies limited claim data based on a 2.5 year claim maturity date. Claims taking longer than 2.5 years from date of injury to date of settlement were excluded.

developed from the data set. Bowden (1997) created a similar model to display comparisons among expected permanent partial disability (PPD) benefits among Tennessee's thirty-one (31) judicial districts. The model simplifies comparisons, allows for control variables and generates an average permanent partial disability percentage, an average physician impairment rating and an expected permanent partial disability multiplier (PPDM) for back injury claims (Boden, 1997). The typical injured employee can be compared against the average of any specific variable and compared against the permanent partial disability multiplier (PPDM) by county, district, or geographic region.

The typical injured employee model allows predictions to be converted to dollars which allows a per dollar comparison among each percentage point of permanent partial disability (PPD) (Boden, 1997). Tennessee pays four (4) weeks of benefits for each point of permanent partial disability (PPD). For purposes of this study the most important measure of permanent partial disability (PPD) benefits is the final permanent partial disability rating (Boden, 1997). The model developed for this study expands on the Boden (1997) model. Included are the same variables (age, back claim, lost-time, physician impairment rating, average compensation rate and returned to work) plus the addition of the following variables: average weekly wage, days to maximum medical improvement, days to claim maturity, education level, surgery, average permanent partial disability award and how the claim was filed and settled in Tennessee.

The additional variables were added for two principal reasons: (1) the literature review found these variables to be influential in assessing permanent partial disability (PPD) benefits and (2) Tennessee law (T.C.A. §50-6-241) takes into account vocational

disability as the ultimate issue in the assessment of an injured employees ability to earn income in any line of work considering the disabled condition.

Research Questions

To investigate research question one (1) a crosstabulation was performed on selected demographic and injury characteristics. Table 3.5 and Table 3.6 illustrate the demographic and the injury characteristic crosstabulations.

To investigate research questions two (2) through nine (9) a regression analysis was run. The best prediction on the average permanent partial disability multiplier (PPDM) is to regress back toward the mean of the average treating physician impairment rating for non-return-to-work (NRTW) and return-to-work (RTW) employees. Knowing how much regression toward the mean there is for a particular variable gives you a prediction (Maxwell & Delaney, 2000). The less significant the regression the better the prediction that is the extent to which the value of the dependent variable: the final permanent partial disability rating is associated with the constant variables. The variables of interest are the main effects of age, education, compensation rate, nature of injury, surgery, days to maximum medical improvement (MMI), treating physician impairment rating (tp), the interaction of the treating physician impairment rating (tp^2) and independent medical examination (IME). Table 3.7 illustrates the statistical procedure used to analyze each research question.

Table 3.5 Demographic and Injury Characteristics of Tennessee Injured Employees (2000 – 2003) Research Question 1 Categorical Data: Able to Return-to-Work and Education

Categorical Data	Year of Injury	TN County of Injury	District	Geographic Region	Surgery	Statistical Test
Able to Return-to-Work	Yes No	Yes No	Yes No	Yes No	Yes No	Observed, Expected Adjusted Residual
Education		Less Than 9th Grade	Less Than 9th Grade	Less Than 9th Grade		Observed, Expected Adjusted Residual
		Some High School	Some High School	Some High School		Observed, Expected Adjusted Residual
		GED	GED	GED		Observed, Expected Adjusted Residual
		High School	High School	High School		Observed, Expected Adjusted Residual
		Some College	Some College	Some College		Observed, Expected Adjusted Residual
		BS/BA	BS/BA	BS/BA		Observed, Expected Adjusted Residual
		Graduate Degree	Graduate Degree	Graduate Degree		Observed, Expected Adjusted Residual

Table 3.6

Demographic and Injury Characteristics of Tennessee Injured Employees (2000 – 2003) Research Question 1
Categorical Data: Surgery and Settlement Method

Categorical Data	Year of Injury	TN County of Injury	District	Geographic Region	Able to Return to Work	Statistical Test
Surgery	Yes No	Yes No	Yes No	Yes No	Yes No	Observed, Expected Adjusted Residual
Settlement Method			Trial	Trial		Observed, Expected Adjusted Residual
			Settlement Approved by Court-Complaint Filed	Settlement Approved by Court-Complaint Filed		Observed, Expected Adjusted Residual
			Settlement Approved by Court-Complaint Not Filed	Settlement Approved by Court-Complaint Not Filed		Observed, Expected Adjusted Residual
			Settlement Approved by TN Department of Labor	Settlement Approved by TN Department of Labor		Observed, Expected Adjusted Residual

Table 3.7 Statistical Analyses Performed for Each Research Question

Research Question	Analyses Performed
1. What are the selected demographic and injury characteristics of Tennessee injured employees with a back claim 2000 – 2003?	Crosstabulation
2. Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees in Tennessee significantly differ based on age, education level, and injury characteristics?	Regression
3. Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees in Tennessee significantly differ based on age, education level, and injury characteristics?	Regression
4. Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees in Tennessee significantly differ based on settlement method used to reach a permanent partial disability award?	Regression
5. Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees in Tennessee significantly differ based on settlement method used to reach a permanent partial disability award?	Regression
6. Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees significantly differ between judicial districts in Tennessee?	Regression
7. Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees significantly differ between judicial districts in Tennessee?	Regression
8. Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees in Tennessee significantly differ by geographic region (East, Middle, West) based on the settlement method used to reach a permanent partial disability award?	Regression
9. Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees in Tennessee significantly differ by geographic region (East, Middle West) based on the settlement method used to reach a permanent partial disability award?	Regression

Summary

This chapter described the research design, the Statistical Data Form (SD-1), the research methodology and data analysis procedures used in the research study. The study addressed the population of workers who suffered a back injury and settled a workers' compensation claim during calendar years 2000 – 2003. The study population is not a sample but represents the entire population of back-injury claims from which a Statistical Data Form (SD-1) was filed with the Tennessee Department of Labor and Workforce Development Division in Nashville. The parametric test performed in this study was regression.

CHAPTER IV

ANALYSIS OF THE DATA

Introduction

The purpose of this study was to investigate the relationship between the permanent partial disability multiplier (PPDM) for back injuries and the settlement method used (settlement approved by court - complaint filed; settlement approved by court - complaint not filed; settlement Tennessee Department of Labor; and trial) to reach a permanent partial disability (PPD) award. Chapter IV presents the findings and analysis of the workers' compensation data. Demographic information illustrating the workers' compensation experience and descriptive data were presented. The research questions were discussed, analyzed and statistically tested at the .05 level of significance.

Data Analysis

Tennessee Typical Injured Employee

The typical injured employee for the study period had a mean average age of 41 with a high school diploma and a back strain that was non-surgical. The treating physician impairment rating (PPI) averaged 7.5% and the final permanent partial disability (PPD) percentage averaged 24.05%. The average permanent partial disability multiplier (PPDM) is 3.2. The average weekly wage equaled $529.84 with a

compensation (benefit) rate of $347.06.[16] The employee lost an average of 165 days (23.57 weeks) of work due to the injury and reached maximum medical improvement in 292 days (41.71 weeks). The average number of days from date of injury to claim maturity is 639 days (91.28 weeks). The settlement method chosen to resolve the claim was settlement approved by the Department of Labor. Table 4.1 illustrates the typical injured employee in the state of Tennessee.

Demographic and Injury Characteristics of Tennessee Injured Employees with a Back Claim - Research Question 1

This study addressed the population of workers who suffered a back injury and settlement of a workers' compensation claim during calendar years 2000 – 2003. All demographic information was obtained from the State of Tennessee's Statistical Data Form (SD-1). The population of all claim data is 6,398. Table 4.2 illustrates the population data by calendar year.

Tennessee incorporates a two-tier system for permanent partial disability (PPD) benefits for unscheduled injuries. Permanent partial disability (PPD) benefits and the permanent partial disability multiplier (PPDM) are dependent upon whether or not the injured employee is able to return-to-work with the pre-injury employer. Therefore, the data was divided into two groups: (1) employees who returned to work (RTW) and (2) employees that did not return-to-work (NRTW). Descriptive analysis is provided for

[16] The compensation (benefit rate) rate did not equal 66 2/3 of the average weekly wage. This was due to missing data as well as inaccurate reporting on the Statistical Data Form (SD-1). The difference was $6.18.

Table 4.1 Typical Injured Employee in the State of Tennessee

Typical Injured Employee	
Variable	State Average
Age	41
Educational Level	High School
Average Weekly Wage	$529.84
Compensation (Benefit) Rate	$347.06
Work Days Lost	165
Days to Maximum Medical Improvement	292
Days to Claim Maturity	639
Nature of Injury	Sprain/Strain
Surgery	Non-Surgical
Treating Physician Impairment Rating	7.50%
Able to Return-to-Work	Yes
Permanent Partial Disability Percentage	24.05%
Permanent Partial Disability Multiplier	3.2
Settlement Method	Department of Labor

Table 4.2 Population Data by Calendar Year

Year	Frequency	Percent	Cumulative Percent
2000	1388	21.7	21.7
2001	2069	32.3	54.0
2002	1811	28.3	82.3
2003	1130	17.7	100.0
Total	6398	100.0	

return-to-work outcomes by calendar year, Tennessee county of injury, judicial district and geographic region. The specific descriptive analysis for all crosstabulations is illustrated in tables located in the Appendices. The data does not suggest that all employees returned to work were capped by the 2 ½ multiplier cap. The descriptive analysis illustrates any value considered to be significant. In other words, only those values below -2 or above +2 are considered statistically significant. To assist the reader, the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores. Look for values well below -2 or above +2.

Year of Injury and Employee Ability to Return-to-Work

For the study period (2000 – 2003) sixty percent (60.4%) or 3,866 employees were able to return-to-work with their pre-injury employer compared to twenty-one

percent (20.9%) or 1,339 employees who were unable to return-to-work with their pre-injury employer. In any given calendar year more employees were able to return-to-work than employees unable to return-to-work.

An employer may return an employee back to work without meeting a meaningful return-to-work standard. The employer must establish that a reasonable attempt was made to return the employee back to work in order to limit permanent partial disability (PPD) benefits to 2 ½ times the medical impairment rating. Otherwise, the employee may receive up to six times the highest medical impairment rating. Table 4.3 illustrates the descriptive analysis year of injury and employee ability to return-to-work.

Tennessee County of Injury and Employee Return-to-Work Outcomes

A descriptive analysis was utilized to reveal how Tennessee counties faired at returning employees back to work. Tennessee counties that returned less than expected employees back to work included Carter, Scott, Blount and Fentress. Counties that returned more than expected employees back to work included Shelby and Tipton. Table 4.4 illustrates only those counties found to be statistically significant.

Tennessee County of Injury and Employee Non-Return-to-Work Outcomes

A descriptive analysis was utilized to reveal how Tennessee counties faired at not returning employees back to work. Counties with less than expected non-return-to-work outcomes included Shelby, Obion and Madison. Counties with more than expected

Table 4.3 Year of Injury and Employee Ability to Return-to-Work

Year of Injury	Able to Return-to-Work: Missing	No Return-to-Work (NRTW)	Return-to-Work (RTW)	Total
2000	277	357	754	1388
2001	341	440	288	2069
2002	366	332	1133	1811
2003	209	210	711	1130
Total	1193	1339	3866	6398

Table 4.4 Tennessee County of Injury and Employee Return-to-Work Outcomes

TN County of Injury	**Return to Work (RTW)** Count	Expected Count	Adjusted Residual
Less Than Expected			
Carter	8	14.5	-2.7
Scott	24	33.2	-2.6
Blount	46	56.8	-2.3
Fentress	2	5.4	-2.3
More Than Expected			
Shelby	504	420.6	6.9
Tipton	18	12.7	2.4

* To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

non-return-to work outcomes included Carter, Sullivan, Cocke, Washington, Bradley, Blount and Campbell. Table 4.5 illustrates only those counties found to be statistically significant.

Tennessee Judicial District and Employee Return-to-Work Outcomes

A descriptive analysis was utilized to reveal how Tennessee judicial districts faired at returning employees back to work. Districts with less than expected employees back to work included district 1, 5, and 8. Districts that returned more than expected employees back to work included district 25, 28, and 30. Table 4.6 illustrates only those districts that were statistically significant. The reader may want to refer back to Table 3.2 to reference what counties are associated with a particular district.

Tennessee Judicial District and Employee Non-Return-to-Work Outcomes

A descriptive analysis was utilized to reveal how Tennessee judicial districts faired at not returning employees back to work. Districts with less than expected non-return-to-work outcomes included districts 26, 27, 28, and 30. Districts with more than expected non-return-to-work outcomes included districts 1, 2, 5, 8, and 10. Table 4.7 illustrates only those districts that were statistically significant. The reader may want to refer back to Table 3.2 to reference what counties are associated with a particular district.

Table 4.5 Tennessee County of Injury and Employee Non-Return-to-Work Outcomes

TN County of Injury	Non-Return-to-Work (NRTW) Count	Expected Count	Adjusted Residual
Less Than Expected			
Shelby	93	145.7	-5.2
Obion	7	22	-3.6
Madison	21	34.5	-2.6
More Than Expected			
Carter	13	5	4.0
Sullivan	59	40	3.4
Cocke	18	9.4	3.2
Washington	44	32.6	2.3
Bradley	28	19.5	2.2
Blount	28	19.7	2.1
Campbell	18	11.7	2.1

[17]

[17] To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

Table 4.6 Tennessee Judicial District and Employee Return-to-Work Outcomes

TN Judicial District	Return to Work (RTW) Count	Expected Count	Adjusted Residual
Less Than Expected			
8	75	96.2	-3.5
1	104	124.2	-2.9
5	46	57.2	-2.4
More Than Expected			
30	504	423.7	6.6
25	80	67	2.6
28	74	63.3	2.2

[18]

[18] To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

Table 4.7 Tennessee Judicial District and Employee Non-Return-to-Work Outcomes

TN Judicial District	Non-Return-to-Work (NRTW) Count	Expected Count	Adjusted Residual
Less Than Expected			
30	93	141.5	-4.9
26	21	38.8	-3.3
27	15	28.5	-2.9
28	12	21.1	-2.2
More Than Expected			
1	65	41.5	4.2
8	53	32.1	4.2
2	59	38.8	3.7
10	58	39.8	3.3
5	28	19.1	2.3

[19]

[19] To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

Tennessee Geographic Region and Employee Return-to-Work Outcomes

A descriptive analysis was utilized to reveal how Tennessee geographic regions faired at returning employees back to work. The geographic region that returned less than expected employees back to work was the East. Middle Tennessee was not significant. The geographic region that returned more than expected employees back to work was the West. Middle Tennessee was not significant. Table 4.8 illustrates the geographic region's that were statistically significant. The reader may want to refer back to Table 3.2 and Table 3.3 to reference what counties and districts are associated with a particular geographic region.[20]

Table 4.8 Tennessee Geographic Region and Employee Return-to-Work Outcomes

	Return-to-Work (RTW)		
TN Geographic Region	Count	Expected Count	Adjusted Residual
Less Than Expected			
East	1376	1488.5	-6
Middle	1357	1360.1	-.2*
More Than Expected			
West	963	847.4	7.2
Middle	1357	1360.1	-.2*

* Not statistically significant.

[20] To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

Tennessee Geographic Region and Employee Non-Return-to-Work Outcomes

A descriptive analysis was utilized to reveal how Tennessee geographic regions faired at not returning employees back to work. The geographic region with less than expected non-return-to-work outcomes is West Tennessee. Middle Tennessee was not significant. The geographic region with more than expected non-return-to-work outcomes is East Tennessee. Middle Tennessee was not significant. Table 4.9 illustrates the geographic regions that were statistically significant. The reader may want to refer back to Table 3.2 and Table 3.3 to reference what counties and districts are associated with a particular geographic region.[21]

Table 4.9 Tennessee Geographic Region and Employee Non-Return-to-Work Outcomes

	Non-Return to Work (NRTW)		
TN Geographic Region	Count	Expected Count	Adjusted Residual
Less Than Expected			
West	184	282.9	-7.5
Middle	443	454.1	-0.7*
More Than Expected			
East	607	497	7.2
Middle	443	454.1	-0.7*

* Not Statistically Significant

[21] To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

Education Level and Tennessee Employees with a Back Injury

Vocational disability takes into account whether there has been a decrease in the employee's ability to earn wages in any line of work available considering the disabled condition. In assessing the extent of an employee's vocational disability the employee's educational background is considered and the employee's permanent partial disability (PPD) award is based in part on educational attainment. Educational level was broken down into seven (7) categories: (1) less than 9th grade; (2) some high school; (3) GED; (4) high school diploma; (5) some college; (6) BS/BA; and (7) graduate degree for purposes of descriptive analysis. Eight-three percent (82.7%) of Tennessee employees with a back injury and permanent partial disability (PPD) benefits achieved a high school diploma or education less than a high school diploma. Table 4.10 illustrates the educational attainment of injured employees for the years 2000 – 2003.

Educational Level and Tennessee County of Injury

A descriptive analysis was utilized to reveal how Tennessee counties faired based on the educational attainment of injured employees. The Tennessee counties with less than expected employees with less than a 9th grade education included Anderson, Madison and Shelby. Counties with more than expected employees with less than a 9th grade education included Bradley, Cocke, Cumberland, Henry, Johnson, Lake, Sumner and Wayne. Tennessee counties with less than expected employees with some high school included Madison, Obion and Shelby. Counties with more than expected

Table 4.10 Education Level and Tennessee Employees with a Back Injury

Education Level			
	Frequency	Percent	Cumulative Percent
Missing	1573	24.6	24.6
Less than 9th Grade	266	4.2	28.8
Some High School	857	13.4	42.2
GED	459	7.2	49.4
High School Diploma	2133	33.3	82.7
Some College	871	13.6	96.3
BS/BA	174	2.7	99.0
Graduate Degree	65	1.0	100.0
Total	6398	100.0	

employees with some high school included Bedford, Cocke, Pickett and Sullivan. The Tennessee county with less than expected employees with a GED is Shelby. Counties with more than expected employees with a GED included Greene and Sequatchie. The Tennessee counties with less than expected employees with a high school diploma included Bradley, Cumberland, Davidson, Hamilton, Maury, Obion, Sumner and Williamson. Counties with more than expected employees with a high school diploma included Anderson, Carter, Gibson, Hardeman, Lauderdale, Roane and Shelby.

No Tennessee counties were statistically significant for having less than expected employees with some college education. The Tennessee county with more than expected employees with some college education is Shelby. No Tennessee counties were

statistically significant for having less than expected employees with a BS/BA. The Tennessee county with more than expected employees with a BS/BA is Jackson. The Tennessee county with less than expected employees with a graduate degree is Hamilton. The Tennessee counties with more than expected employees with a graduate degree included Davidson, DeKalb, Grainger, Henderson, Smith and Williamson. Table 4.11 illustrates the Tennessee counties that were statistically significant for education level.

Education Level and Tennessee Judicial District

A descriptive analysis was utilized to reveal how Tennessee judicial districts faired based on the educational attainment of injured employees. The Tennessee districts with less than expected employees with less than a 9th grade education included districts 7, 26, and 30. Districts with more than expected employees with less than a 9th grade education included districts 3, 4, 8, 10, 13, and 18. The Tennessee district with less than expected employees with some high school is 30. The Tennessee districts with more than expected employees with some high school included 2, 8, 10, and 24. The Tennessee district with less than expected employees with a GED is 30. The Tennessee district with more than expected employees with a GED is 3. The Tennessee districts with less than expected employees with a high school diploma included 10, 11, 13, 18, 20, and 22. Districts with more than expected employees with a high school diploma included 1, 3, 7, 9, 25, 28, and 30. The Tennessee district with less than expected employees with some college is 25. The Tennessee district with more than expected employees with some college is 30. The Tennessee district with more than expected employees with a BS/BA

Table 4.11 Education Level and Tennessee County of Injury

		Education Level						
TN County of Injury		Less than 9th Grade	Some High School	GED	High School Diploma	Some College	BS/ BA	Graduate Degree
Anderson	Count	0			67			
	Expected Count	6.4			51.3			
	Adjusted Residual	-2.6			2.7			
Bedford	Count		10					
	Expected Count		4.7					
	Adjusted Residual		2.6					
Bradley	Count	12			14			
	Expected Count	3.9			31			
	Adjusted Residual	4.3			-3.8			
Carter	Count				13			
	Expected Count				8			
	Adjusted Residual				2.2			
Cocke	Count	7	11					
	Expected Count	1.9	6					
	Adjusted Residual	3.8	2.2					
Cumberland	Count	5			7			
	Expected Count	1.9			15			
	Adjusted Residual	2.3			-2.5			
Davidson	Count				179			33
	Expected Count				218.4			17.8
	Adjusted Residual				-3.4			3.9
DeKalb	Count							2
	Expected Count							0.5
	Adjusted Residual							2.1

Table 4.11 Continued

TN County of Injury		Education Level						
		Less than 9th Grade	Some High School	GED	High School Diploma	Some College	BS/ BA	Graduate Degree
Gibson	Count				32			
	Expected Count				23			
	Adjusted Residual				2.3			
Grainger	Count							1
	Expected Count							0.1
	Adjusted Residual							2.7
Greene	Count			11				
	Expected Count			5.1				
	Adjusted Residual			2.7				
Hamilton	Count				115			0
	Expected Count				135			4.1
	Adjusted Residual				-2.2			-2.1
Hardeman	Count				14			
	Expected Count				7.3			
	Adjusted Residual				3.0			
Henderson	Count							1
	Expected Count							0.2
	Adjusted Residual							2.2
Henry	Count	6						
	Expected Count	1.7						
	Adjusted Residual	3.4						
Jackson	Count						1	
	Expected Count						0.1	
	Adjusted Residual						2.4	
Johnson	Count	2						
	Expected Count	0.3						
	Adjusted Residual	3.2						

Table 4.11 Continued

TN County of Injury		Education Level						
		Less than 9th Grade	Some High School	GED	High School Diploma	Some College	BS/ BA	Graduate Degree
Lake	Count	1						
	Expected Count	0.1						
	Adjusted Residual	3.2						
Lauderdale	Count				16			
	Expected Count				9.3			
	Adjusted Residual				2.7			
Madison	Count	1	13					
	Expected Count	6.9	22.1					
	Adjusted Residual	-2.3	-2.1					
Maury	Count				25			
	Expected Count				35.7			
	Adjusted Residual				-2.2			
Obion	Count		4		25			
	Expected Count		14.1		35			
	Adjusted Residual		-2.9		-2.1			
Pickett	Count		2					
	Expected Count		0.4					
	Adjusted Residual		2.7					
Roane	Count				33			
	Expected Count				23.3			
	Adjusted Residual				2.5			
Sequatchie	Count			3				
	Expected Count			0.7				
	Adjusted Residual			2.8				
Shelby	Count	17	75	29	280	136		
	Expected Count	28.9	93.2	49.9	232	94.8		
	Adjusted Residual	-2.4	-2.1	-3.3	4.1	4.8		
Smith	Count							1
	Expected Count							0.1
	Adjusted Residual							2.4

Table 4.11 Continued

TN County of Injury		Education Level						
		Less than 9th Grade	Some High School	GED	High School Diploma	Some College	BS/ BA	Graduate Degree
Sullivan	Count		36					
	Expected Count		25.6					
	Adjusted Residual		2.2					
Sumner	Count	10			26			
	Expected Count	5			40.3			
	Adjusted Residual	2.3			-2.8			
Wayne	Count	3						
	Expected Count	0.5						
	Adjusted Residual	3.4						
Williamson	Count				19			4
	Expected Count				28.7			0.9
	Adjusted Residual				-2.2			3.4

22

[22]To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

is 20. The Tennessee district with less than expected employees with a graduate degree is 11. The Tennessee district with more than expected employees with a graduate degree is 21. Table 4.12 illustrates only those districts that are statistically significant. The reader may want to refer back to Table 3.2 to reference what counties are associated with a particular district.

Education Level and Tennessee Geographic Region

A descriptive analysis was utilized to reveal how Tennessee geographic regions faired based on educational attainment of employees at time of injury. No geographic regions were significant for less than or more than expected employees with a 9th grade education. The Tennessee geographic region with less than expected employees with some high school education is West Tennessee. The geographic region with more than expected employees with some high school education is East Tennessee. The Tennessee geographic region with less than expected employees with a GED is West Tennessee. The geographic region with more than expected employees with a GED is East Tennessee.

The Tennessee geographic region with less than expected employees with a high school diploma is Middle Tennessee. The geographic region with more than expected employees with a high school diploma is West Tennessee. No Tennessee geographic region was significant for less than expected employees with some college education. The geographic region with more than expected employees with some college is West Tennessee. No Tennessee geographic region was significant for less than expected

Table 4.12 Education Level and Tennessee Judicial District

		Education Level						
TN Judicial District		Less than 9th Grade	Some High School	GED	High School Diploma	Some College	BS/ BA	Graduate Degree
1	Count				83			
	Expected Count				67.9			
	Adjusted Residual				2.3			
2	Count		36					
	Expected Count		25.5					
	Adjusted Residual		2.3					
3	Count	15		24	84			
	Expected Count	8.8		14.9	69.5			
	Adjusted Residual	2.2		2.5	2.2			
4	Count	15						
	Expected Count	7.9						
	Adjusted Residual	2.6						
7	Count	0			67			
	Expected Count	6.5			51.2			
	Adjusted Residual	-2.6			2.7			
8	Count	13	32					
	Expected Count	6.6	21.1					
	Adjusted Residual	2.6	2.6					
9	Count				50			
	Expected Count				37.3			
	Adjusted Residual				2.6			
10	Count	17	36		42			
	Expected Count	8.2	26.1		65.2			
	Adjusted Residual	3.2	2.1		-3.6			
11	Count				114			0
	Expected Count				134.1			4.2
	Adjusted Residual				-2.2			-2.1
13	Count	13			34			
	Expected Count	6.4			50.9			
	Adjusted Residual	2.7			-2.9			

Table 4.12 Continued

TN Judicial District		Education Level: Less than 9th Grade	Some High School	GED	High School Diploma	Some College	BS/ BA	Graduate Degree
18	Count	10			26			
	Expected Count	5			39.9			
	Adjusted Residual	2.3			-2.7			
20	Count				179		33	
	Expected Count				217.9		18.4	
	Adjusted Residual				-3.4		3.6	
21	Count							4
	Expected Count							1.2
	Adjusted Residual							2.5
22	Count				46			
	Expected Count				61.2			
	Adjusted Residual				-2.4			
24	Count		23					
	Expected Count		14.5					
	Adjusted Residual		2.4					
25	Count				52	7		
	Expected Count				36.6	15		
	Adjusted Residual				3.1	-2.2		
26	Count	1						
	Expected Count	8						
	Adjusted Residual	-2.6						
28	Count				47			
	Expected Count				34.6			
	Adjusted Residual				2.6			
30	Count	17	75	29	280	136		
	Expected Count	29.2	92.7	49.5	231.6	95		
	Adjusted Residual	-2.5	-2.1	-3.2	4.1	4.8		

*To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

employees with a BS/BA. The geographic region with more than expected employees with a BS/BA is Middle Tennessee. No Tennessee geographic regions were significant for less than or more than expected employees with a graduate degree. Table 4.13 illustrates only those geographic regions that were statistically significant. The reader may want to refer back to Table 3.2 and Table 3.3 to reference what counties and districts are associated with a particular geographic region.

Surgery: Non-Surgical and Surgical Outcomes (2000 – 2003)

Surgery was performed on 43.5% of employees with a back injury claim that filed a Statistical Data Form (SD-1) for calendar years 2000 – 2003. In contrast, 50.2% of employees with a back injury claim that filed a Statistical Data Form (SD-1) for calendar years 2000 – 2003 did not have surgery. Table 4.14 illustrates the summary of back surgeries performed on Tennessee employees during the years 2000 – 2003.

Surgery and Employee Ability to Return-to-Work

A descriptive analysis was utilized to reveal how Tennessee employees faired at returning to work after back surgery. Six hundred and sixty-five (665) employees were unable to return-to-work after back surgery. One thousand seven hundred and nine (1,709) employees returned to work after back surgery. Of the 2,785 surgeries performed on Tennessee employees sixty-one (61.3%) were able to return-to-work. Table 4.15 illustrates the results of the descriptive analysis.

Table 4.13 Education Level and Tennessee Geographic Region

TN Geographic Region		Education Level					
		Less than 9th Grade	Some High School	GED	High School Diploma	Some College	BS/ BA	Graduate Degree
East	Count		356	195				
	Expected Count		325.8	174				
	Adjusted Residual		2.3	2.1				
Middle	Count				642		76	
	Expected Count				743.3		62.9	
	Adjusted Residual				-5.7		2.1	
West	Count		154	81	534	217		
	Expected Count		185.5	99.1	463.2	190.1		
	Adjusted Residual		-2.8	-2.1	4.6	2.4		

23

[23] To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

Table 4.14 Surgery: Non-Surgical and Surgical Outcomes (2000 – 2003)

Non-Surgical and Surgical Outcomes			
Surgery	Frequency	Percent	Cumulative Percent
Missing	401	6.3	6.3
No	3212	50.2	56.5
Yes	2785	43.5	100.0
Total	6398	100.0	

Table 4.15 Surgery and Employee Ability to Return-to-Work

	Employee Able to Return-to-Work			
Surgery Performed	Missing	No	Yes	Total
Missing	200	47	154	401
No	582	627	2003	3212
Yes	411	665	1709	2785
Total	1193	1339	3866	6398

Surgery and Tennessee County of Injury

A descriptive analysis was utilized to reveal how Tennessee counties faired on the number of surgeries performed on employees with a back injury claim. The Tennessee counties with less than expected non-surgical employees with a back injury included Cheatham, Davidson, Obion, Rutherford, Shelby, Tipton and Warren. Counties with more than expected non-surgical employees with a back injury included Anderson, Blount, Campbell, Cocke, Hamilton, Knox, Madison, Montgomery, Sevier and Sullivan. The Tennessee counties with less than expected employees that had back surgery included Anderson, Campbell, Cocke, Hamilton, Knox, Montgomery and Sevier. Counties with more than expected employees that had back surgery included Fayette, Obion, Rutherford, Shelby and Tipton. Table 4.16 illustrates only those counties that were statistically significant.

Surgery and Tennessee Judicial District

A descriptive analysis was utilized to reveal how Tennessee judicial districts faired on the number of surgeries performed on employees with a back injury. The Tennessee judicial districts with less than expected non-surgical employees with a back injury include districts 16, 18, 20, 25, 27, 30, and 31. Districts with more than expected non-surgical employees with a back injury included districts 2, 4, 5, 6, 7, 8, 11, 19, and 26. The Tennessee judicial districts with less than expected employees that had back surgery included 4, 6, 7, 8, 11, and 19. Districts with more than expected employees that had back surgery included 16, 20, 25, 27, and 30. Table 4.17 illustrates only those districts that were statistically significant.

Table 4.16 Surgery and Tennessee County of Injury

TN County of Injury	Surgery Performed					
	No Surgery			Surgery		
	Count	Expected Count	Adjusted Residual	Count	Expected Count	Adjusted Residual
Anderson	104	77.3	4.4	47	67	-3.3
Blount	59	47.2	2.5			
Campbell	40	28.1	3.2	12	24.4	-3.4
Cheatham	9	15.1	-2.2			
Cocke	30	22.6	2.2	11	19.6	-2.6
Davidson	296	328.8	-2.7			
Fayette				8	4.4	2.3
Hamilton	234	203.3	3.2	145	176.3	-3.2
Knox	300	258	3.0	184	223.7	-3.7
Madison	99	82.8	2.5			
Montgomery	60	44.7	3.3	25	38.7	-3.0
Obion	30	52.7	-4.5	67	45.7	4.2
Rutherford	114	161.7	-5.5	183	140.2	4.9
Sevier	67	52.2	2.9	32	45.3	-2.6

Table 4.16 Continued

TN County of Injury	Surgery Performed					
	No Surgery			Surgery		
	Count	Expected Count	Adjusted Residual	Count	Expected Count	Adjusted Residual
Shelby	302	349.4	-3.8	363	303	4.9
Sullivan	111	95.9	2.2			
Sumner	49	60.7	-2.2			
Tipton	4	10.5	-2.9	17	9.1	3.5
Warren	14	21.1	-2.2			

[24]

[24] To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

Table 4.17 Surgery and Tennessee Judicial District

TN Judicial District	Surgery Performed					
	No Surgery			Surgery		
	Count	Expected Count	Adjusted Residual	Count	Expected Count	Adjusted Residual
2	111	96.2	2.2			
4	121	95.2	3.8	57	81.8	-3.7
5	59	47.4	2.4			
6	299	258.5	3.7	184	222	-3.5
7	104	77.6	4.3	47	66.6	-3.2
8	95	79.6	2.5	53	68.4	-2.5
11	233	203.1	3.1	144	174.4	-3.2
16	118	165.3	-5.4	185	141.9	4.9
18	48	60.5	-2.3			
19	83	66.5	2.9	43	57.1	-2.5
20	296	330	-2.8	308	283.4	2.1
25	40	55.4	-3.0	64	47.6	3.2
26	115	96.2	2.8			
27	49	70.5	-3.7	83	60.6	3.9
30	302	350.7	-3.9	363	301.2	5.0
31	14	21.2	-2.2			

* To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

Surgery and Tennessee Geographic Region

A descriptive analysis was utilized to reveal how Tennessee geographic regions faired on the number of surgeries performed on employees with a back injury claim. The Tennessee geographic regions with less than expected non-surgical employees with a back injury included Middle and West Tennessee. The geographic region with more than expected non-surgical employees with a back injury is East Tennessee. The Tennessee geographic region with less than expected employees that had back surgery is East Tennessee. The geographic region's with more than expected employees that had back surgery included Middle and West Tennessee. Table 4.18 illustrates the summary of surgeries performed for Tennessee geographic regions. The reader may want to refer back to Table 3.2 and Table 3.3 to reference what counties and districts are associated with a particular geographic region.

Table 4.18 Surgery and Tennessee Geographic Region

TN Geographic Region	**Surgery Performed**					
	No Surgery			Surgery		
	Count	Expected Count	Adjusted Residual	Count	Expected Count	Adjusted Residual
East	1411	1232	9.4	890	1058	-8.9
Middle	1006	1125.6	-6.4	1047	966.7	4.3
West	642	701.4	-3.6	690	602.3	5.4

* To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

Settlement Method

Tennessee utilizes a court-administered system for resolving workers' compensation claims. The state allows for all settlements of compensation by agreement of the parties and all awards of compensation made by a court of competent jurisdiction. Copies of all settlements and releases are required to be filed with the Department of Labor within ten (10) days of the settlement (T.C.A. §50-6-228). A settlement approved at the Tennessee Department of Labor resolved the majority of workers' compensation claims during 2000 – 2003 (2,345) followed by Settlement Approved by Court - Complaint Filed (2,103), Settlement Approved by Court - Complaint Not Filed (1,735) and Trial (215). Table 4.19 illustrates the summary of settlement method by calendar year.

Table 4.19 Settlement Method (2000 – 2003)

	Settlement Method				
Year	2000	2001	2002	2003	Total
Settlement Approved by Court - Complaint Filed	611	699	556	237	2103
Settlement Approved by Court - Complaint Not Filed	286	570	503	376	1735
Settlement Department of Labor	419	734	693	499	2345
Trial	72	66	59	18	215
Total	1388	2069	1811	1130	6398

Settlement Method and Tennessee Judicial District

A descriptive analysis was utilized to reveal how Tennessee districts faired on the settlement method chosen to resolve a workers' compensation claim. The Tennessee districts with less than expected settlement approved by court - complaint filed included 1, 2, 3, 4, and 30. Districts with more than expected settlement approved by court - complaint filed included 7, 8, 10, 11, 12, 13, 14, 15, 16, 20, and 31. The Tennessee districts with less than expected settlement approved by court - complaint not filed included 1, 2, 3, 4, 5, 6, 7, 8, 9, 24, 25, 26, 28, and 30. Districts with more than expected settlement approved by court - complaint not filed included 11, 15, 16, 17, 18, 19, 20, 21, 22, and 23. The Tennessee districts with less than expected settlement Department of Labor included 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 27, and 31. District's with more than expected settlement Department of Labor included 1, 2, 3, 4, 5, 6, 25, 28, and 30. Tennessee districts with less than expected trials included 11 and 30. District's with more than expected trials included 9, 16, 24, and 27. Table 4.20 illustrates the settlement methods that were statistically significant. The reader may want to refer back to Table 3.2 to reference what counties are associated with a particular judicial district.

Settlement Method and Tennessee Geographic Region

A descriptive analysis was utilized to reveal how Tennessee geographic regions faired on the settlement method chosen to resolve a workers' compensation claim. The Tennessee region that had fewer than expected settlements approved by court – complaint filed was West Tennessee. The Tennessee geographic region that had more than expected settlements approved by court – complaint filed is Middle Tennessee.

Table 4.20 Settlement Method and Tennessee Judicial District

TN Judicial District		Settlement Method			
		Settlement Approved by Court Complaint Filed	Settlement Approved by Court Complaint Not Filed	Settlement Department of Labor	Trial
1	Count	29	12	161	
	Expected Count	67	55.1	75.1	
	Adjusted Residual	-5.8	-6.9	12.7	
2	Count	22	14	151	
	Expected Count	62.8	51.6	70.3	
	Adjusted Residual	-6.4	-6.2	12.3	
3	Count	43	30	131	
	Expected Count	68.7	56.5	76.9	
	Adjusted Residual	-3.8	-4.2	7.9	
4	Count	41	33	107	
	Expected Count	62.1	51.1	69.5	
	Adjusted Residual	-3.3	-3.0	5.7	

Table 4.20 Continued

TN Judicial District		Settlement Method			
		Settlement Approved by Court Complaint Filed	Settlement Approved by Court Complaint Not Filed	Settlement Department of Labor	Trial
5	Count		15	51	
	Expected Count		25.4	34.6	
	Adjusted Residual		-2.4	3.5	
6	Count		81	254	
	Expected Count		138.6	188.8	
	Adjusted Residual		-6.0	6.2	
7	Count	68	30		
	Expected Count	50.6	41.6		
	Adjusted Residual	3.0	-2.1		
8	Count	78	18		
	Expected Count	51.9	42.7		
	Adjusted Residual	4.5	-4.5		

Table 4.20 Continued

TN Judicial District		Settlement Method			
		Settlement Approved by Court Complaint Filed	Settlement Approved by Court Complaint Not Filed	Settlement Department of Labor	Trial
9	Count		18		10
	Expected Count		30.3		3.7
	Adjusted Residual		-2.6		3.3
10	Count	90		48	
	Expected Count	64.4		72.1	
	Adjusted Residual	4		-3.6	
11	Count	172	156	69	6
	Expected Count	132.4	108.9	148.3	13.4
	Adjusted Residual	4.3	5.5	-8.5	-2.1
12	Count	56		23	
	Expected Count	39.1		43.8	
	Adjusted Residual	3.3		-4.0	

Table 4.20 Continued

TN Judicial District		Settlement Method			
		Settlement Approved by Court Complaint Filed	Settlement Approved by Court Complaint Not Filed	Settlement Department of Labor	Trial
13	Count	75		22	
	Expected Count	50.3		56.3	
	Adjusted Residual	4.3		-5.8	
14	Count	45		5	
	Expected Count	26.6		29.8	
	Adjusted Residual	4.4		-5.8	
15	Count	59	51	10	
	Expected Count	41.7	34.3	46.7	
	Adjusted Residual	3.3	3.4	-6.8	
16	Count	125	158	25	20
	Expected Count	107.8	88.6	120.7	10.9
	Adjusted Residual	2.1	8.9	-11.3	2.9

Table 4.20 Continued

TN Judicial District		Settlement Method			
		Settlement Approved by Court Complaint Filed	Settlement Approved by Court Complaint Not Filed	Settlement Department of Labor	Trial
17	Count		38	17	
	Expected Count		22.2	30.2	
	Adjusted Residual		4	-3.0	
18	Count		54	17	
	Expected Count		32.4	44.2	
	Adjusted Residual		4.5	-5.2	
19	Count		48	29	
	Expected Count		35.7	48.6	
	Adjusted Residual		2.4	-3.6	
20	Count	260	301	81	
	Expected Count	215.2	176.9	241	
	Adjusted Residual	3.9	11.6	-13.7	

Table 4.20 Continued

TN Judicial District		Settlement Method			
		Settlement Approved by Court Complaint Filed	Settlement Approved by Court Complaint Not Filed	Settlement Department of Labor	Trial
21	Count		71	10	
	Expected Count		32.1	43.8	
	Adjusted Residual		8.1	-6.5	
22	Count		82	28	
	Expected Count		49.7	67.7	
	Adjusted Residual		5.4	-6.2	
23	Count		57	7	
	Expected Count		28.4	38.6	
	Adjusted Residual		6.3	-6.5	
24	Count		16		9
	Expected Count		29.4		3.6
	Adjusted Residual		-2.9		2.9

Table 4.20 Continued

TN Judicial District		Settlement Method			
		Settlement Approved by Court Complaint Filed	Settlement Approved by Court Complaint Not Filed	Settlement Department of Labor	Trial
25	Count		15	66	
	Expected Count		29.7	40.5	
	Adjusted Residual		-3.2	5.1	
26	Count		33		
	Expected Count		51.6		
	Adjusted Residual		-3.1		
27	Count			23	29
	Expected Count			51.5	4.7
	Adjusted Residual			-5.1	11.6
28	Count		16	55	
	Expected Count		28.1	38.3	
	Adjusted Residual		-2.7	3.4	

Table 4.20 Continued

TN Judicial District		Settlement Method			
		Settlement Approved by Court Complaint Filed	Settlement Approved by Court Complaint Not Filed	Settlement Department of Labor	Trial
30	Count	76	73	544	3
	Expected Count	228.7	188	256.1	23.2
	Adjusted Residual	-13.1	-10.4	24.0	-4.5
31	Count	22		2	
	Expected Count	13.8		15.5	
	Adjusted Residual	2.7		-4.3	

[25]

[25] To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

Tennessee geographic regions that had fewer than expected settlements approved by court – complaint not filed are East and West Tennessee. The Tennessee geographic region that had more than expected settlements approved by court - complaint not filed is Middle Tennessee. The Tennessee geographic region that had fewer than expected settlements approved by the Tennessee Department of Labor is Middle Tennessee. East and West Tennessee had more than expected settlements approved by the Department of Labor. East Tennessee had fewer than expected trials. Table 4.21 illustrates the settlement methods that were statistically significant. The reader may want to refer back to Table 3.2 and Table 3.3 to reference what counties and districts are associated with a particular geographic region.

Tennessee Non-Return-to-Work Employee Characteristics and Permanent Partial Disability Multiplier Variation - Research Question 2

Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees in Tennessee differ based on age, education level and injury characteristics?

To investigate the research question a regression analysis was run. The best prediction on the average permanent partial disability multiplier is to regress back toward the mean of the average treating physician impairment rating for non-return-to-work employees. Knowing how much regression toward the mean there is for a particular variable gives you a prediction (Maxwell & Delaney, 2000). The variables of interest are the main effects of age, education, compensation rate, nature of injury, surgery, days to

Table 4.21 Settlement Method and Tennessee Geographic Region

TN Geographic Region		Settlement Method			
		Settlement Complaint Filed	Settlement Complaint Not Filed	Settlement Department of Labor	Trial
East	Count		468	1135	66
	Expected Count		660.5	899.7	81.4
	Adjusted Residual		-11.3	12.8	-2.2
Middle	Count	902	984	270	
	Expected Count	734.1	603.5	822.1	
	Adjusted Residual	9.5	22.8	-30.5	
West	Count	317	188	829	
	Expected Count	457.4	376	512.2	
	Adjusted Residual	-9.1	-12.9	20.1	

[26]

[26] To assist the reader the adjusted residual is the difference between the observed count for that cell and its expected count. Read the values as Z scores while looking for values well below -2 or above +2 to identify cells that depart markedly from the model of independence. **Any value below -2 or above +2 is considered statistically significant.**

maximum medical improvement (MMI), treating physician impairment rating (tp), the interaction of the treating physician impairment rating (tp^2) and independent medical examination (IME). The regression analysis estimated a less than .001 level of significance with a R^2 value of .508 which explains fifty-one percent (50.8%) of the variability in the model.

Six of the nine controlling variables are significant (p-value = .05) for non-return-to-work employees. Individuals with less than a high school education can expect on average 3.76% more in total indemnity benefits. Surgery increases total indemnity benefits by 12.07%. For each point of impairment indemnity benefits increase on average by 1.88%. An independent medical examination on average increases total indemnity benefits by 8.42% and days to maximum medical improvement (MMI) increases total indemnity benefits by .014% for each additional day. It is important to note that for purposes of comparison among the controlling variables that the treating physician impairment rating has the greatest affect on indemnity benefits (β = .654) followed by surgery (β = .237), independent medical exam (IME) (β = .146), days to maximum medical improvement (β = .127) and education less than high school (β = .065). Table 4.22 illustrates the results of the regression analysis.

Tennessee Return-to-Work Employee Characteristics and Permanent Partial Disability Multiplier Variation - Research Question 3

Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees in Tennessee differ based on age, education level and injury characteristics?

Table 4.22

Tennessee Non-Return-to-Work Employee Characteristics
and Permanent Partial Disability Multiplier Variation
Research Question 2

Coefficients (a, b, c)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	(Constant)	10.234	1.965		5.207	.000
	Age <25	-2.283	2.787	-.017	-.819	.413
	Age 25-34	-1.819	1.336	-.030	-1.362	.174
	Age 45-54	.049	1.337	.001	.037	.971
	Age 55+	.758	1.650	.010	.460	.646
	Education > than High School	3.757	1.196	.065	3.142	.002
	Education < than High School	-1.182	1.437	-.017	-.823	.411
	Compensation Rate	-.003	.004	-.015	-.724	.469
	Strain/Sprain	-.902	1.095	-.018	-.824	.410
	Surgery	12.079	1.297	.237	9.310	.000
	Days to Maximum Medical Improvement	.014	.002	.127	5.967	.000
	Impairment Rating	1.881	.124	.654	15.181	.000
	Interaction Treating Physician Impairment Rating	-.012	.002	-.216	-5.812	.000
	Independent Medical Examination	8.418	1.183	.146	7.116	.000

a Dependent Variable: Permanent Partial Disability Percentage
b Able to Return to Prior Employment? = NO
c R Square = .508

To investigate the research question a regression analysis was run controlling for the following demographics (age, education, compensation rate, strain-sprain, surgery, days to maximum medical improvement (MMI), treating physician impairment rating (tp), the interaction of the treating physician impairment rating (tp^2) and independent medical examination (IME). The best prediction on the average permanent partial disability multiplier is to regress back toward the mean of the treating physician impairment rating for return-to-work employees. Knowing how much regression toward the mean there is for a particular variable gives you a prediction (Maxwell & Delaney, 2000). The regression analysis estimated a less than .001 level of significance with a R^2 value of .515 which explains fifty-one and a half percent (51.5%) of the variability in the model. Seven of the nine controlling variables are significant (p-value = .05) for return-to-work employees. Individuals with less than a high school education can expect on average 1.51% more in total indemnity benefits. Surgery increases total indemnity benefits by 3.88%. Compensation rate decreases total indemnity benefits on average by -.010%. For each point of impairment indemnity benefits increase on average by 1.80%. An independent medical examination on average increases total indemnity benefits by 7.92% and days to maximum medical improvement increases total indemnity benefits by .007% for each additional day. It is important to note that for purposes of comparison among the controlling variables that the treating physician impairment rating has the greatest affect on indemnity benefits (β = .858) followed by independent medical exam (β = .211), surgery (β = .129), days to maximum medical improvement (β = .100), education less than high school (β = .037) and compensation rate (β = -.097). Table 4.23 illustrates the results of the regression analysis.

Table 4.23

Tennessee Return-to-Work Employee Characteristics
and Permanent Partial Disability Multiplier Variation
Research Question 3

Coefficients (a, b, c)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	(Constant)	5.670	.674		8.410	.000
	Age <25	-.903	.837	-.013	-1.078	.281
	Age 25-34	-.233	.460	-.007	-.507	.612
	Age 45-54	.456	.445	.013	1.023	.306
	Age 55+	.928	.607	.019	1.531	.126
	Education > than High School	1.511	.488	.037	3.093	.002
	Education < than High School	-.869	.444	-.023	-1.956	.051
	Compensation Rate	-.010	.001	-.097	-7.983	.000
	Strain/Sprain	-.555	.366	-.019	-1.518	.129
	Surgery	3.889	.424	.129	9.163	.000
	Days to Maximum Medical Improvement	.007	.001	.100	8.556	.000
	Impairment Rating	1.803	.041	.858	44.282	.000
	Interaction Treating Physician Impairment Rating	-.009	.000	-.478	-27.932	.000
	Independent Medical Examination	7.921	.445	.211	17.786	.000

a Dependent Variable: Permanent Partial Disability Percentage
b Able to Return to Prior Employment? = YES
c R Square = .515

The Settlement Method of Tennessee Non-Return-to-Work Employees and Permanent Partial Disability Multiplier Variation - Research Question 4

Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees in Tennessee significantly differ based on the settlement method used to reach a permanent partial disability award?

To investigate the research question a regression analysis was run controlling for the following demographics (age, education, compensation rate, strain-sprain, surgery, days to maximum medical improvement (MMI), treating physician impairment rating (tp), the interaction of the treating physician impairment rating (tp^2) and independent medical examination (IME). The best prediction on the average permanent partial disability multiplier is to regress back toward the mean of the treating physician impairment rating for non-return-to-work employees. Knowing how much regression toward the mean there is for a particular variable gives you a prediction (Maxwell & Delaney, 2000). The variables of interest are the main effects of settlement approved by court – complaint filed, settlement approved by court – complaint not filed and trial will be compared against settlement approved by the Department of Labor. Interactions between main effects and the treating physician impairment rating (tp) will be examined. The regression analysis estimated a less than .001 level of significance with a R^2 value of .530 which explains fifty-three percent (53%) of the variability in the model.

The prediction is that settlements reached between the parties when approved by the court - complaint filed on average increase total indemnity benefits by 5.234% and cases resolved at trial on average increase total indemnity benefits by 11.406% compared

to a settlement approved by the Department of Labor. Table 4.24 illustrates the results of the regression analysis.

The Settlement Method of Tennessee Return-to-Work Employees and Permanent Partial Disability Multiplier Variation - Research Question 5

Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees in Tennessee significantly differ based on the settlement method used to reach a permanent partial disability award?

To investigate the research question a regression analysis was run controlling for the following demographics (age, education, compensation rate, strain-sprain, surgery, days to maximum medical improvement (MMI), treating physician impairment rating (tp), the interaction of the treating physician impairment rating (tp^2) and independent medical examination (IME). The best prediction on the average permanent partial disability multiplier is to regress back toward the mean of the treating physician impairment rating for return-to-work employees. Knowing how much regression toward the mean there is for a particular variable gives you a prediction (Maxwell & Delaney, 2000). The variables of interest are the main effects of settlement approved by court - complaint filed, settlement approved by court - complaint not filed and trial will be compared against settlement approved by the Department of Labor. Interactions between main effects and the treating physician impairment rating (tp) will be examined. The regression analysis estimated a less than .001 level of significance with a R^2 value of .543 which explains fifty-four percent (54.3%) of the variability in the model.

Table 4.24

The Settlement Method of Tennessee Non-Return-to-Work Employees and Permanent Partial Disability Multiplier Variation
Research Question 4

Coefficients (a, b, c)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	Settlement approved by court complaint filed	5.234	1.774	.101	2.951	.003*
	Settlement approved by court complaint not filed	.747	2.202	.012	.339	.735
	Trial	11.406	3.546	.095	3.217	.001*
	Interaction settlement approved by court complaint filed	.196	.150	.060	1.308	.191
	Interaction settlement approved by court complaint not filed	.095	.169	.024	.564	.573
	Interaction Trial	.221	.242	.029	.914	.361

a Dependent Variable: Permanent Partial Disability Percentage
b Able to Return to Prior Employment = NO
c R Square = .530
*p = < .05

The results of the analysis found that three (3) settlement methods are significant (p-value = .05) when compared to settlements approved by the Department of Labor in return-to-work claims. The prediction is that settlements reached between the parties when approved by the court - complaint filed increase total indemnity benefits on average by 1.345% and cases resolved at trial increase total indemnity benefits on average by 3.729% when compared to a settlement approved by the Department of Labor. A settlement approved by court - complaint not filed reduces total indemnity benefits on average by -3.862% when compared to a settlement approved by the Tennessee Department of Labor. Table 4.25 illustrates the results of the regression analysis.

Judicial District of Non-Return-to-Work Employees and Permanent Partial Disability Multiplier Variation - Research Question 6

Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees significantly differ between judicial districts in Tennessee?

To investigate the research question a regression analysis was run controlling for the following demographics (age, education, compensation rate, strain-sprain, surgery, days to maximum medical improvement (MMI), treating physician impairment rating (tp), the interaction of the treating physician impairment rating (tp^2) and independent medical examination (IME). Unknowns represent the comparison group and are those claims from which the county of injury is not known (Boden, 1997). The best prediction on the average permanent partial disability multiplier is to regress back toward the mean

Table 4.25

The Settlement Method of Tennessee Return-to-Work Employees and Permanent Partial Disability Multiplier Variation Research Question 5

Coefficients (a, b, c)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
	Settlement approved by court complaint filed	1.345	.597	.041	2.255	.024*
	Settlement approved by court complaint not filed	-3.862	.626	-.119	-6.173	.000*
	Trial	3.729	1.707	.038	2.185	.029*
	Interaction settlement approved by court complaint filed	.441	.062	.150	7.053	.000*
	Interaction settlement approved by court complaint not filed	.441	.064	.172	6.935	.000*
	Interaction Trial	-.083	.176	-.008	-.469	.639

a Dependent Variable: Permanent Partial Disability Percentage
b Able to Return to Prior Employment = YES
c R Square = .543
*p = <.05

of the treating physician impairment rating for non-return-to-work employees. Knowing how much regression toward the mean there is for a particular variable gives you a prediction (Maxwell & Delaney, 2000). The variables of interest are the main effects of district and interaction of the treating physician impairment rating (tp). The regression analysis estimated a less than .001 level of significance with a R^2 value of .565 which explains fifty-six and half percent (56.5%) of the variability in the model.

The result of the regression analysis is that judicial district is significant in non-return-to-work claims (p-value = .05). More specifically, judicial districts 4, 6, 9, 14, and 16 increases the amount of indemnity benefits paid on average when compared to unknowns for non-return-to-work employees. District 4 increases indemnity benefits on average by 1.23%. District 6 increases indemnity benefits on average by .693%. District 9 increases indemnity benefits on average by 1.19%. District 14 increases indemnity benefits on average by 1.06% and district 16 increases indemnity benefits on average by .650%. Table 4.26 illustrates the results of the regression analysis.

Judicial District of Return-to-Work Employees and Permanent Partial Disability Multiplier Variation - Research Question 7

Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees significantly differ between judicial districts in Tennessee?

To investigate the research question a regression analysis was run controlling for the following demographics (age, education, compensation rate, strain-sprain, surgery, days to maximum medical improvement (MMI), the treating physician impairment rating

Table 4.26

Judicial District of Non-Return-to-Work Employees
and Permanent Partial Disability Multiplier Variation
Research Question 6

Coefficients (a, b, c)

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
tp_d1	.105	.395	.009	.266	.791
tp_d2	.357	.371	.035	.963	.336
tp_d3	-.114	.359	-.011	-.318	.750
tp_d4	1.227	.440	.090	2.786	.005*
tp_d5	.171	.514	.012	.333	.740
tp_d6	.693	.324	.080	2.137	.033*
tp_d7	.265	.511	.020	.520	.603
tp_d8	.461	.302	.063	1.528	.127
tp_d9	1.187	.520	.075	2.281	.023*
tp_d10	-.079	.337	-.009	-.236	.814
tp_d11	.638	.326	.087	1.956	.051
tp_d12	-.565	.417	-.036	-1.353	.176
tp_d13	.769	.484	.052	1.589	.112
tp_d14	1.059	.520	.061	2.036	.042*
tp_d15	.154	.353	.014	.437	.663
tp_d16	.650	.276	.092	2.355	.019*
tp_d17	.743	.519	.051	1.432	.152
tp_d18	.083	.597	.005	.139	.889
tp_d19	-.614	.581	-.028	-1.057	.291
tp_d20	.344	.253	.059	1.358	.175
tp_d21	-.120	.485	-.009	-.247	.805
tp_d22	.779	.428	.060	1.823	.069
tp_d23	.387	.497	.028	.778	.437
tp_d24	-.974	.867	-.043	-1.122	.262
tp_d25	.463	.564	.030	.820	.412
tp_d26	.181	.605	.008	.300	.764
tp_d27	.388	.540	.023	.720	.472
tp_d28	1.640	.924	.061	1.774	.076
tp_d29	2.223	1.965	.059	1.131	.258
tp_d30	-.012	.287	-.002	-.043	.965
tp_d31	2.664	1.620	.055	1.645	.100

a Dependent Variable: Permanent Partial Disability Percentage
b Able to Return to Prior Employment = NO
c R Square = .565
*p < = .05

(tp), the interaction of the treating physician impairment rating (tp^2) and independent medical examination (IME). Unknowns represent the comparison group and are those claims from which the county of injury is not known (Boden, 1997). The best prediction on the average permanent partial disability multiplier is to regress back toward the mean of the treating physician impairment rating for return-to-work employees. Knowing how much regression toward the mean there is for a particular variable gives you a prediction (Maxwell & Delaney, 2000). The variables of interest are the main effects of district and interaction of the treating physician impairment rating (tp). The regression analysis estimated a less than .001 level of significance with a R^2 value of .557 which explains fifty-six percent (55.7%) of the variability in the model.

The results of the regression analysis is that judicial district is significant in return-to-work claims (p-value = .05). District 5 increases indemnity benefits on average by .729%. District 6 decreases indemnity benefits on average by -.442%. District 7 decreases indemnity benefits on average by -.375%. District 19 decreases indemnity benefits on average by -.520%. District 26 decreases indemnity benefits on average by -.717%. Table 4.27 illustrates the results of the regression analysis.

Geographic Region (East, Middle and West) of Non-Return-to-Work Employees and Permanent Partial Disability Multiplier Variation - Research Question 8

Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees in Tennessee significantly differ by Geographic Region (East, Middle and West) based on the settlement method used to reach a permanent partial disability award?

Table 4.27

Judicial District of Return-to-Work Employees
and Permanent Partial Disability Multiplier Variation
Research Question 7

Coefficients (a, b, c)

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
tp_d1	-.027	.240	-.003	-.113	.910
tp_d2	-.130	.216	-.013	-.604	.546
tp_d3	-.194	.223	-.019	-.868	.386
tp_d4	.123	.225	.012	.546	.585
tp_d5	.729	.303	.048	2.404	.016*
tp_d6	-.442	.161	-.094	-2.747	.006*
tp_d7	-.375	.176	-.058	-2.127	.033*
tp_d8	-.227	.220	-.020	-1.030	.303
tp_d9	.141	.234	.013	.604	.546
tp_d10	.057	.213	.007	.268	.788
tp_d11	-.054	.175	-.015	-.309	.758
tp_d12	-.063	.241	-.006	-.261	.794
tp_d13	-.252	.226	-.027	-1.113	.266
tp_d14	.018	.308	.001	.058	.954
tp_d15	.213	.276	.015	.770	.441
tp_d16	-.093	.194	-.013	-.481	.631
tp_d17	-.085	.337	-.006	-.254	.800
tp_d18	.055	.249	.005	.222	.824
tp_d19	-.520	.239	-.048	-2.177	.030*
tp_d20	-.089	.162	-.019	-.551	.582
tp_d21	.420	.231	.041	1.814	.070
tp_d22	-.220	.226	-.024	-.974	.330
tp_d23	-.089	.284	-.007	-.314	.753
tp_d24	-.099	.272	-.007	-.363	.717
tp_d25	-.045	.264	-.004	-.170	.865
tp_d26	-.717	.243	-.057	-2.954	.003*
tp_d27	-.045	.237	-.004	-.189	.850
tp_d28	-.161	.287	-.010	-.562	.574
tp_d29	-.258	.392	-.012	-.657	.511
tp_d30	.087	.168	.017	.519	.604
tp_d31	-.304	.441	-.016	-.689	.491

a Dependent Variable: Permanent Partial Disability Percentage
b Able to Return to Prior Employment? = YES
c R Square = .557
*p = <.05

To investigate the research question a regression analysis was run controlling for the following demographics (age, education, compensation rate, strain-sprain, surgery, days to maximum medical improvement (MMI), treating physician impairment rating (tp), the interaction of the treating physician impairment rating (tp^2) and independent medical examination (IME). The best prediction on the average permanent partial disability multiplier is to regress back toward the mean of the treating physician impairment rating for non-return-to-work employees. Knowing how much regression toward the mean there is for a particular variable gives you a prediction (Maxwell & Delaney, 2000). The variables of interest are the main effects of geographic regions 2 (Middle) and 3 (West) compared to geographic region 1 (East). The regression analysis estimated a less than .001 level of significance with a R^2 value of .534 which explains fifty-three percent (53.4%) of the variability in the model.

The results of the regression analysis is that geographic region is not significant in non-return-to-work claims (p-value = .05). Table 4.28 illustrates the results of the regression analysis.

Geographic Region (East, Middle and West) of Return-to-Work Employees and Permanent Partial Disability Multiplier Variation - Research Question 9

Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees in Tennessee significantly differ by geographic region (East, Middle and West) based on the settlement method used to reach a permanent partial disability award?

Table 4.28

Geographic Region (East, Middle and West) of Non-Return-to-Work Employees and Permanent Partial Disability Multiplier Variation
Research Question 8

Coefficients (a, b, c)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
	Geographic Region 1	2.162	1.780	.042	1.214	.225
	Geographic Region 3	1.431	2.477	.019	.578	.564
	Interaction Geographic Region 1	.107	.133	.031	.810	.418
	Interaction Geographic Region 3	-.083	.199	-.014	-.415	.678

a Dependent Variable: Permanent Partial Disability Percentage
b Able to Return to Prior Employment = NO
c R Square = .534
*p = < .05

To investigate the research question a regression analysis was run controlling for the following demographics (age, education, compensation rate, strain-sprain, surgery, days to maximum medical improvement (MMI), the treating physician impairment rating (tp), the interaction of the treating physician impairment rating (tp^2) and independent medical examination (IME). The best prediction on the average permanent partial disability multiplier is to regress back toward the mean of the treating physician impairment rating for return-to-work employees. Knowing how much regression toward the mean there is for a particular variable gives you a prediction (Maxwell & Delaney, 2000). The variables of interest are the main effects of geographic regions 2 (Middle) and 3 (West) compared to geographic region 1 (East). The regression analysis estimated a less than .001 level of significance with a R^2 value of .543 which explains fifty-four percent (54.3%) of the variability in the model.

The results of the regression analysis is that geographic region is not significant in return-to-work claims (p-value = .05). Table 4.29 illustrates the results of the regression analysis.

Summary

This chapter provided the statistical findings for the nine (9) research questions related to back injury claims in the state of Tennessee for the calendar years 2000 – 2003. Regression analysis was run with a p-value of .05. The demographic and descriptive information have been included in this chapter.

Table 4.29

Geographic Region (East, Middle and West) of Return-to-Work Employees and Permanent Partial Disability Multiplier Variation
Research Question 9

Coefficients (a, b, c)

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	Geographic Region 1	.368	.643	.012	.572	.567
	Geographic Region 3	-.764	.727	-.022	-1.051	.293
	Interaction Geographic Region 1	-.054	.066	-.023	-.811	.417
	Interaction Geographic Region 3	.051	.082	.013	.626	.531

a Dependent Variable: Permanent Partial Disability Percentage
b Able to Return to Prior Employment = YES
c R Square = .543
*p = <.05

CHAPTER V

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Findings

Based on the data collected in this study the following findings were established.

Tennessee Typical Injured Employee

1. The typical injured employee in the state of Tennessee is 41 years of age with a high school diploma. The nature of the injury was identified as a sprain/strain. The treating physician impairment rating averaged 7.5% to the body-as-a-whole (BAW) and the typical injured employee was a non-surgical candidate and returned to work with the pre-injury employer. Permanent partial disability (PPD) indemnity benefits where paid at 24.05% and approved at the Tennessee Department of Labor. The permanent partial disability multiplier (PPDM) is 3.2. The typical injured employee earned on average $529.84 per week with a compensation (benefit) rate of $347.06. The typical injured employee lost on average 165 days (23.57 weeks) of work and reached maximum medical improvement on average in 292 days (41.71 weeks). The entire claim process took on average 639 days (91.28 weeks).

Demographic and Injury Characteristics of Tennessee Injured Employees with a Back Claim - Research Question 1

1. The majority of injured employees with a back injury claim returned to work with their pre-injury employer. It cannot be determined from the Statistical Data Form (SD-1) if the individual returned to the same pre-injury job.
2. Four counties (Carter, Scott, Blount and Fentress) returned fewer than expected employees back to work.
3. Two counties (Shelby and Tipton) returned more than expected employees back to work.
4. Three counties (Shelby, Obion and Madison) had less than expected non-return-to-work employees.
5. Seven counties (Carter, Sullivan, Cocke, Washington, Bradley, Blount and Campbell) had more than expected non-return-to-work employees.
6. Three districts (1, 5, and 8) returned less than expected employees back to work.
7. Three districts (25, 28, and 30) returned more than expected employees back to work.
8. Four districts (26, 27, 28, and 30) had less than expected non-return-to-work employees.
9. Five districts (1, 2, 5, 8, and 10) had more than expected non-return-to-work employees.
10. East Tennessee returned less than expected employees back to work.
11. West Tennessee returned more than expected employees back to work.

12. West Tennessee had less than expected non-return-to-work employees.
13. East Tennessee had more than expected non-return-to-work employees.
14. The majority of injured employees with a back injury claim achieved a high school diploma.
15. Three counties (Anderson, Madison and Shelby) had less than expected employees with less than a 9^{th} grade education.
16. Eight counties (Bradley, Cocke, Cumberland, Henry, Johnson, Lake, Sumner and Wayne) had more than expected employees with less than a 9^{th} grade education.
17. Three counties (Madison, Obion and Shelby) had less than expected employees with some high school education.
18. Four counties (Bedford, Cocke, Pickett and Sullivan) had more than expected employees with some high school education.
19. Shelby County had less than expected employees with a GED.
20. Two counties (Greene and Sequatchie) had more than expected employees with a GED.
21. Eight counties (Bradley, Cumberland, Davidson, Hamilton, Maury, Obion, Sumner and Williamson) had less than expected employees with a high school diploma.
22. Seven counties (Anderson, Carter, Gibson, Hardeman, Lauderdale, Roane and Shelby) had more than expected employees with a high school diploma.
23. Shelby County had more than expected employees with some college education.
24. Jackson County had more than expected employees with a BS/BA.
25. Hamilton County had less than expected employees with a graduate degree.

26. Six counties (Davidson, DeKalb, Grainger, Henderson, Smith and Williamson) had more than expected employees with a graduate degree.
27. Three districts (7, 26, and 30) had less than expected employees with less than a 9^{th} grade education.
28. Six districts (3, 4, 8, 10, 13, and 18) had more than expected employees with less than a 9^{th} grade education.
29. District 30 had less than expected employees with some high school.
30. Four districts (2, 8, 10, and 24) had more than expected employees with some high school.
31. District 30 had less than expected employees with a GED.
32. District 3 had more than expected employees with a GED.
33. Six districts (10, 11, 13, 18, 20, and 22) had less than expected employees with a high school diploma.
34. Seven districts (1, 3, 7, 9, 25, 28, and 30) had more than expected employees with a high school diploma.
35. District 25 had less than expected employees with some college education.
36. District 30 had more than expected employees with some college education.
37. District 20 had more than expected employees with a BS/BA.
38. District 11 had less than expected employees with a graduate degree.
39. District 21 had more than expected employees with a graduate degree.
40. West Tennessee had less than expected employees with some high school.
41. East Tennessee had more than expected employees with some high school.
42. West Tennessee had less than expected employees with a GED.

43. East Tennessee had more than expected employees with a GED.
44. Middle Tennessee had less than expected employees with a high school diploma.
45. West Tennessee had more than expected employees with a high school diploma.
46. West Tennessee had more than expected employees with some college.
47. Middle Tennessee had more than expected employees with a BS/BA.
48. The majority of injured employees did not have back surgery.
49. Seven counties (Cheatham, Davidson, Obion, Rutherford, Shelby, Tipton and Warren) had less than expected non-surgical employees with a back injury.
50. Ten counties (Anderson, Blount, Campbell, Cocke, Hamilton, Knox, Madison, Montgomery, Sevier and Sullivan) had more than expected non-surgical employees with a back injury.
51. Seven counties (Anderson, Campbell, Cocke, Hamilton, Knox, Montgomery and Sevier) had less than expected employees with back surgery.
52. Five counties (Fayette, Obion, Rutherford, Shelby and Tipton) had more than expected employees with back surgery.
53. Seven districts (16, 18, 20, 25, 27, 30, and 31) had less than expected non-surgical employees with a back injury.
54. Nine districts (2, 4, 5, 6, 7, 8, 11, 19, and 26) had more than expected non-surgical employees with a back injury.
55. Six counties (4, 6, 7, 8, 11, and 19) had less than expected employees with back surgery.
56. Five districts (16, 20, 25, 27, and 30) had more than expected employees with back surgery.

57. Middle and West Tennessee had less than expected non-surgical employees with a back injury.
58. East Tennessee had more than expected non-surgical employees with a back injury.
59. East Tennessee had less than expected employees with back surgery.
60. Middle and West Tennessee had more than expected employees with back surgery.
61. The majority of settlements where approved at the Tennessee Department of Labor.
62. Five districts (1, 2, 3, 4, and 30) had less than expected settlement approved by court - complaint filed.
63. Eleven districts (7, 8, 10, 11, 12, 13, 14, 15, 16, 20, and 31) had more than expected settlement approved by court - complaint filed.
64. Fourteen districts (1, 2, 3, 4, 5, 6, 7, 8, 9, 24, 25, 26, 28, and 30) had less than expected settlement approved by court - complaint not filed.
65. Ten districts (11, 15, 16, 17, 18, 19, 20, 21, 22, and 23) had more than expected settlement approved by court - complaint not filed.
66. Sixteen districts (10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 27, and 31) had less than expected settlement approved at the Department of Labor.
67. Nine districts (1, 2, 3, 4, 5, 6, 25, 28, and 30) had more than expected settlement approved at the Department of Labor.
68. Two districts (11 and 30) had less than expected trials.
69. Four districts (9, 16, 24, and 27) had more than expected trials.

Tennessee Non-Return-to-Work Employee Characteristics and Permanent Partial Disability Multiplier Variation - Research Question 2

Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees in Tennessee differ based on age, education level, and injury characteristics?

A significant difference was found among individuals with education less than high school for non-return-to-work employees. The regression analysis predicted 3.76% more in permanent partial disability indemnity benefits paid. A significant difference was found among non-return-to-work employees who had surgery. The regression analysis predicted 12.07% more in permanent partial disability indemnity benefits paid. A significant difference was found among non-return-to-work employees who had an independent medical examination. The regression analysis predicted 8.42% more in permanent partial disability indemnity benefits paid.

Tennessee Return-to-Work Employee Characteristics and Permanent Partial Disability Multiplier Variation - Research Question 3

Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees in Tennessee differ based on age, education level, and injury characteristics?

A significant difference was found among return-to-work employees with education less than high school. The regression analysis predicted 1.51% more in permanent partial

disability indemnity benefits paid. A significant difference was found among return-to-work employees who had surgery. The regression analysis predicted 3.88% more in permanent partial disability indemnity benefits paid. A significant difference was found among return-to-work employees who had an independent medical examination. The regression analysis predicted 7.92% more in permanent partial disability indemnity benefits paid.

The Settlement Method of Tennessee Non-Return-to-Work Employees and Permanent Partial Disability Multiplier Variation - Research Question 4

Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees in Tennessee significantly differ based on the settlement method used to reach a permanent partial disability award?

A significant difference was found among non-return-to-work claims that were resolved before a court of law when compared against settlements approved by the Tennessee Department of Labor. The regression analysis predicted 11.406% more in permanent partial disability indemnity benefits paid. A significant difference was found among non-return-to-work claims that where approved by a court – complaint filed when compared against settlements approved by the Tennessee Department of Labor. The regression analysis predicted 5.234% more in permanent partial disability indemnity benefits paid.

The Settlement Method of Tennessee Return-to-Work Employees and Permanent Partial Disability Multiplier Variation - Research Question 5

Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees in Tennessee significantly differ based on the settlement method used to reach a permanent partial disability award?

A significant difference was found among return-to-work claims that were resolved before a court of law when compared against settlements approved by the Tennessee Department of Labor. The prediction is that claims resolved at trial in return-to-work claims increase permanent partial disability indemnity benefits paid by 3.729%. A significant difference was found among return-to-work claims approved by court – complaint filed when compared to settlements approved by the Tennessee Department of Labor. The prediction is that settlements approved by court – complaint filed increase permanent partial disability indemnity benefits paid by 1.345%. A significant difference was found among return-to-work claims approved by court – complaint not filed when compared to settlements approved by the Tennessee Department of Labor. The prediction is that settlements approved by court – complaint not filed decrease the amount of permanent partial disability indemnity benefits paid by -3.862%.

The majority of the settlement approvals involved return-to-work outcomes. Interestingly, the majority of the claims resolved at trial also involved return-to-work outcomes.

Judicial District of Non-Return-to-Work Employees and Permanent Partial Disability Multiplier Variation - Research Question 6

Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees significantly differ based on judicial districts in Tennessee?

A significant difference was found among Tennessee judicial districts for non-return-to-work employees. The prediction is that the following judicial districts: 4, 6, 9, 14, and 16 pay more in permanent partial disability indemnity benefits when compared to districts of an unknown origin.

Judicial District of Return-to-Work Employees and Permanent Partial Disability Multiplier Variation - Research Question 7

Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees significantly differ based on judicial districts in Tennessee?

A significant difference was found among Tennessee judicial districts for return-to-work employees. The prediction is that the following judicial districts: 5, 6, 7, 19, and 26 pay different permanent partial disability indemnity benefits when compared to districts of an unknown origin. District 5 increases the permanent partial disability indemnity benefits paid while districts 6, 7, 19, and 26 decreases the amount of permanent partial disability indemnity benefits paid.

Geographic Region (East, Middle and West) of Non-Return-to-Work Employees and Permanent Partial Disability Multiplier Variation - Research Question 8

Does the magnitude of the permanent partial disability multiplier for back injuries of non-return-to-work employees in Tennessee significantly differ by geographic region (East, Middle and West) based on the settlement method used to reach a permanent partial disability award?

The regression analysis found no significant difference between Tennessee geographic regions in non-return-to-work claims when using a .05 level of significance.

Geographic Region (East, Middle and West) of Return-to-Work Employees and Permanent Partial Disability Multiplier Variation - Research Question 9

Does the magnitude of the permanent partial disability multiplier for back injuries of return-to-work employees in Tennessee significantly differ by geographic region (East, Middle and West) based on the settlement method used to reach a permanent partial disability award?

The regression analysis found no significant difference between Tennessee geographic regions in return-to-work claims when using a .05 level of significance.

Conclusions

Based upon the findings of this study the following conclusions were made.

1. In Tennessee, non-return-to-work and return-to-work employees with education less than high school with a back injury claim receive significantly higher indemnity benefits than employees with education greater than high school. The majority of injured workers in this research study (82.7%) had no more than a high school education.
2. Employees with an education level high school or less are more likely to file a back injury claim in the state of Tennessee as compared to employees with higher levels of education. The results of this study are similar to the inverse relationship between education and back related disability as reported by a number of authors (Croft and Rigby, 1994; Viikari-Juntura et al, 1991; Leigh and Sheetz, 1989; Bergenudd and Nilsson, 1988; Cunningham and Kelsey, 1984) and also an indicator of back related disability (Badley and Ibanez, 1994; Deyo and Diehl, 1988; Cunningham and Kelsey, 1984). A published study by Dionne et al (1995) investigated the association of education with back related disability. Dionne et al (1995) reported that individuals with thirteen (13) years of education had less disability and greater decline in disability over time compared against those with less education. Dionne et al (1995) investigated enrollees of an HMO seeking primary care for back related pain and did not separate subjects by return-to-work outcomes.

3. A number of published studies have demonstrated that the majority of low-back claims occur in individuals in their thirties and forties (Rowe, 1969; Levitt, Markowitz, & Beyer, 1971; Kertesz and Kormos, 1976; Snook and Campanelli, 1978; Afacan, 1982; Volinn, Van Koevering, & Loeser, 1991; Macdonald et al, 1997). This study had similar results in that the typical injured employee in Tennessee with a back injury claim was 41 years of age.
4. In Tennessee, employees with a work-related back injury claim had a forty-three percent (43.5%) probability of having surgery. The majority of employees in this study that choose surgical intervention returned to work. The results of this study are similar to results reported by Eccleston and Zhao (2005) investigating medical costs and utilization in Tennessee. Workers' compensation claims with greater than seven (7) days of lost time with back pain and nerve involvement ranged from thirty-two (32%) to seventy-one percent (71%) probability of having surgery among study states including Tennessee. Eccleston and Zhao (2005) reported that two-thirds of injured employees in Tennessee and North Carolina had this type of surgery.
5. The method of claim settlement in non-return-to-work and return-to-work claims influenced overall cost of permanent partial disability indemnity benefits paid to an individual with a back claim. Claims resolved at trial had the greatest effect on permanent partial disability indemnity benefits paid. This conclusion confirms results reported by Wood, Morrison, and Macdonald (1993). Wood, Morrison, and Macdonald (1993) reported that "...for a given claim duration, the most important influence on claim costs is the method of settlement". Their

investigation focused on the role of factors other than medical condition; return-to-work outcome was not a factor. An extensive review of the literature did not reveal any similar studies in the United States.

6. Judicial district variation exists in non-return-to-work and return-to-work claims. A majority of districts increase the amount of permanent partial disability indemnity benefits paid while other districts decrease permanent partial disability indemnity benefits. No districts decreased benefits in non-return-to-work claims. The results cannot confirm whether or not the injured employee returned to work at the same pre-injury job. This conclusion confirms results reported by Boden (1997). Boden (1997) did not report a significant difference for 1990 claims when compared against 1992 claims. Boden (1997) did report a significant difference between 1990 and 1992 claims that were adjudicated among body-as-a-whole injury claims.

Recommendations

Based upon the findings, conclusions, and literature review of the study, the following recommendations were made.

1. It is recommended that the state of Tennessee redesign the Statistical Data Form (SD-1). The new form should operationally define what is to be measured, standardize definitions of recovery, measures of recovery, identify the values data can assume and identify a process that supports consistent and accurate completion of the Statistical Data Form (SD-1) across all business sectors.

2. It is recommended that the state of Tennessee in cooperation with the Administrative Office of the Courts implement a new system for collecting all records as it pertains to workers' compensation trials and settlement approvals.
3. It is recommended that the state of Tennessee consider alternate strategies to surgery for those employees with a back injury claim.
4. It is recommended that the state of Tennessee in cooperation with the business and insurance industry support targeted prevention strategies for decreasing the incident rate of back-related injuries among employees with an education level of high school or less.
5. It is recommended that the state of Tennessee conduct a comprehensive study of rulings by judges on permanent partial disability (PPD) benefits for all work-related injuries to establish if judicial district variation exits on the amount of permanent partial disability (PPD) indemnity benefits paid for similar injuries.
6. It is recommended that the state of Tennessee conduct a comprehensive study to investigate reemployment rates of non-return-to-work employees.

Summary

This chapter provided the statistical findings, conclusions, and recommendations for the eight research questions related to back injury claims in the state of Tennessee.

CHAPTER VI

THE STUDY IN RETROSPECT

Introduction

This chapter discusses the study in retrospect. A discussion of the quality of available data from the state of Tennessee, future research projects, a discussion of an adjudicated system versus a commission system and findings for future research are provided to assist researchers to both replicate and improve the research topic addressed in this study.

Quality of Data

Ideally, recording data as they occur is the preferred method of collection. However, such processes are expensive and often impractical. The primary disadvantage of a secondary data source is that data utilized are indirect measures of issues of interest. Reliability of the data is difficult to determine and unrecognized group differences are problematic. In instances of collecting workers' compensation data caution must be exercised because the data is merged together from a host of outside sources. A major contention of this research study was the amount of missing data that otherwise should have been accessible. A tremendous amount of time was utilized in correcting errors, researching Statistical Data Forms (SD-1) and calculating data values for control variables.

In retrospect, collecting smaller segments of data at pre-determined points in time may have allowed for simpler data management and the ability to investigate missing data in a timely manner.

Future Research Objectives

The literature review established several important factors concerning the influence of workers' compensation on recovery and permanent partial disability (PPD) benefits: (1) many authors use various combinations of outcome measures making it difficult to validate results; (2) no two state systems are alike; (3) a majority of the research compares non-compensated patients with compensated patients; (4) lack of standardization in definitions of recovery, measures of recovery, medical and clinical objectives; and (5) what constitutes disability.

Regardless of the variation in how benefits are structured among states the cost associated with the system appears to be of great concern to employers, insurance companies, state legislators and the medical community. Previous published research has established that these costs are rising especially in the cost of long duration claims (i.e., greater than sixty-days). Injured workers are concerned with loss of wages and cash benefits not only in the short-term but over the span of their work life.

Future research could benefit from prospective studies that investigate injured workers long-term employability given permanent work restrictions, long-term economic consequences associated with a particular injury and employee's ability to return to the kind of work performed prior to a work-related injury. There are limited studies that assess the long-term effect of loss of earning power as a result of a work-related injury

and ability to compete in the open labor market. No studies have been based on Tennessee data.

Court-Administered System v. Commission System

While Tennessee remains one of two states[27] with a court-administered system for resolving workers' compensation claims there still remains inconclusive statistical data to suggest that Tennessee's court-administered system is failing. A recent study (Telles, Wang, & Tanabe, 2006) reported Tennessee close to the median of the thirteen (13) participating states in various benchmark categories. When investigating loss-time claims greater than seven days Tennessee's average cost per claim is significantly higher but its important to note that the majority of claims in Tennessee settle without litigation and settle with "lump-sum" benefits being paid to the injured employee. Tennessee's average temporary disability benefits (TPD) are considerably lower compared than the median of impairment-approach states and loss-of-earning capacity states (Telles, Wang, & Tanabe, 2006).

Tennessee's average medical cost per claim is near the upper tier however it is also important to note that prior to legislative reform in 2004 Tennessee operated without a medical fee schedule. Nevertheless, the expense of delivering medical and indemnity benefits to injured Tennessee employees is similar to that of CompScope™ study states.

The issues of genuine concern to all participants operating in the Tennessee system (that ultimately compel legislative reform) are more a consequence of system

[27] Alabama also utilizes a court-administered system.

factors as opposed to any direct link to the courts and can occur under either system (commission or judicial).

Finally, while continued research is necessary to monitor injury rates and specific types of injuries, medical cost, delivery expense and overall system performance it is important to acknowledge that the ultimate cost saving comes from focusing on injury prevention. This responsibility is shared equally by employee and employer. Top management leadership and support is critical in fostering an atmosphere of awareness, prioritizing workplace safety and providing the financial resources needed to lower workers' compensation costs. Employees have a responsibility of not ignoring safe workplace procedures and recognizing that there are hazards in every workplace and keeping one safe is an employee's first responsibility.

Findings for Continued Research

Boden's study (1997) reported that there was significant variation in the average final permanent partial disability percentage among Tennessee's judicial districts for litigated claims. Judicial district variation has been reported in this research study. Variation among settlement methods was also reported however this does not imply that jurisdictions with the highest ratings are more generous than jurisdictions with average or lower than average ratings (Boden, 1997). Further, it does not imply that a particular settlement method is more generous than other settlement methods with average or lower than average ratings. Future studies investigating rulings by judges can investigate problems of equity in the system.

In retrospect, the investigation of judicial districts may convey more meaning to permanent partial disability (PPD) indemnity benefit variation by averaging the treating physician impairment rating by district as suggested by Boden (1997). Additional information can be gained by separating trial cases and settlement approvals by judges to investigate differences in decision making. Likewise, comparing short-duration claims (less than sixty days) versus long-duration claims (greater than sixty days) can convey differences in benefit outcomes.

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Appendices

Appendix A: Crosstabulation Tables

Table 4.14A

Crosstabulation of the Variables Surgery and Year of Injury

Year of Injury * Surgery Performed Crosstabulation

			Surgery Performed			Total
			N/A	NO	YES	
Year of Injury	2000	Count	108	613	667	1388
		Expected Count	87.0	696.8	604.2	1388.0
		Adjusted Residual	2.6	-5.1	3.8	
	2001	Count	126	984	959	2069
		Expected Count	129.7	1038.7	900.6	2069.0
		Adjusted Residual	-.4	-2.9	3.1	
	2002	Count	97	1003	711	1811
		Expected Count	113.5	909.2	788.3	1811.0
		Adjusted Residual	-1.9	5.2	-4.3	
	2003	Count	70	612	448	1130
		Expected Count	70.8	567.3	491.9	1130.0
		Adjusted Residual	-.1	2.9	-2.9	
Total		Count	401	3212	2785	6398
		Expected Count	401.0	3212.0	2785.0	6398.0

Table 4.4A & Table 4.5A

Crosstabulation of the Variables Able to Return-to-Work and Tennessee County of Injury

TN County of Injury * Able to Return to Prior Employment Crosstabulation

			Able to Return to Prior Employment			Total
			N/A	NO	YES	
TN County of Injury	ANDERSON	Count	25.0	28.0	100.0	153.0
		Expected Count	28.5	32.0	92.5	153.0
		Adjusted Residual	-.7	-.8	1.3	
	BEDFORD	Count	6.0	8.0	21.0	35.0
		Expected Count	6.5	7.3	21.1	35.0
		Adjusted Residual	-.2	.3	-.1	
	BENTON	Count	4.0	9.0	13.0	26.0
		Expected Count	4.8	5.4	15.7	26.0
		Adjusted Residual	-.4	1.7	-1.1	
	BLEDSOE	Count	.0	1.0	3.0	4.0
		Expected Count	.7	.8	2.4	4.0
		Adjusted Residual	-1.0	.2	.6	
	BLOUNT	Count	20.0	28.0	46.0	94.0
		Expected Count	17.5	19.7	56.8	94.0
		Adjusted Residual	.7	2.1	-2.3	
	BRADLEY	Count	11.0	28.0	54.0	93.0
		Expected Count	17.3	19.5	56.2	93.0
		Adjusted Residual	-1.7	2.2	-.5	
	CAMPBELL	Count	11.0	18.0	27.0	56.0
		Expected Count	10.4	11.7	33.8	56.0
		Adjusted Residual	.2	2.1	-1.9	
	CANNON	Count	2.0	.0	4.0	6.0
		Expected Count	1.1	1.3	3.6	6.0
		Adjusted Residual	.9	-1.3	.3	
	CARROLL	Count	6.0	3.0	16.0	25.0
		Expected Count	4.7	5.2	15.1	25.0
		Adjusted Residual	.7	-1.1	.4	

Table 4.4A & Table 4.5A Continued

TN County of Injury * Able to Return to Prior Employment Crosstabulation

		Able to Return to Prior Employment			Total
		N/A	NO	YES	
CARTER	Count	3.0	13.0	8.0	24.0
	Expected Count	4.5	5.0	14.5	24.0
	Adjusted Residual	-.8	4.0	-2.7	
CHEATHAM	Count	6.0	8.0	16.0	30.0
	Expected Count	5.6	6.3	18.1	30.0
	Adjusted Residual	.2	.8	-.8	
CHESTER	Count	4.0	.0	7.0	11.0
	Expected Count	2.1	2.3	6.6	11.0
	Adjusted Residual	1.5	-1.7	.2	
CLAIBORNE	Count	6.0	6.0	15.0	27.0
	Expected Count	5.0	5.7	16.3	27.0
	Adjusted Residual	.5	.2	-.5	
COCKE	Count	5.0	18.0	22.0	45.0
	Expected Count	8.4	9.4	27.2	45.0
	Adjusted Residual	-1.3	3.2	-1.6	
COFFEE	Count	16.0	15.0	50.0	81.0
	Expected Count	15.1	17.0	48.9	81.0
	Adjusted Residual	.3	-.5	.2	
CROCKETT	Count	1.0	2.0	11.0	14.0
	Expected Count	2.6	2.9	8.5	14.0
	Adjusted Residual	-1.1	-.6	1.4	
CUMBERLAND	Count	8.0	12.0	25.0	45.0
	Expected Count	8.4	9.4	27.2	45.0
	Adjusted Residual	-.2	.9	-.7	
DAVIDSON	Count	125.0	131.0	399.0	655.0
	Expected Count	122.1	137.1	395.8	655.0
	Adjusted Residual	.3	-.6	.3	
DECATUR	Count	2.0	.0	7.0	9.0
	Expected Count	1.7	1.9	5.4	9.0
	Adjusted Residual	.3	-1.5	1.1	

Table 4.4A & Table 4.5A Continued

TN County of Injury * Able to Return to Prior Employment Crosstabulation

		Able to Return to Prior Employment			Total
		N/A	NO	YES	
DEKALB	Count	3.0	4.0	12.0	19.0
	Expected Count	3.5	4.0	11.5	19.0
	Adjusted Residual	-.3	.0	.2	
DICKSON	Count	9.0	6.0	25.0	40.0
	Expected Count	7.5	8.4	24.2	40.0
	Adjusted Residual	.6	-.9	.3	
DYER	Count	13.0	7.0	29.0	49.0
	Expected Count	9.1	10.3	29.6	49.0
	Adjusted Residual	1.4	-1.1	-.2	
FAYETTE	Count	2.0	2.0	6.0	10.0
	Expected Count	1.9	2.1	6.0	10.0
	Adjusted Residual	.1	-.1	.0	
FENTRESS	Count	4.0	3.0	2.0	9.0
	Expected Count	1.7	1.9	5.4	9.0
	Adjusted Residual	2.0	.9	-2.3	
FRANKLIN	Count	8.0	12.0	23.0	43.0
	Expected Count	8.0	9.0	26.0	43.0
	Adjusted Residual	.0	1.1	-.9	
GIBSON	Count	11.0	9.0	49.0	69.0
	Expected Count	12.9	14.4	41.7	69.0
	Adjusted Residual	-.6	-1.6	1.8	
GILES	Count	8.0	6.0	14.0	28.0
	Expected Count	5.2	5.9	16.9	28.0
	Adjusted Residual	1.4	.1	-1.1	
GRAINGER	Count	3.0	3.0	5.0	11.0
	Expected Count	2.1	2.3	6.6	11.0
	Adjusted Residual	.7	.5	-1.0	
GREENE	Count	10.0	19.0	42.0	71.0
	Expected Count	13.2	14.9	42.9	71.0
	Adjusted Residual	-1.0	1.2	-.2	

Table 4.4A & Table 4.5A Continued

TN County of Injury * Able to Return to Prior Employment Crosstabulation

		Able to Return to Prior Employment			Total
		N/A	NO	YES	
GRUNDY	Count	.0	3.0	4.0	7.0
	Expected Count	1.3	1.5	4.2	7.0
	Adjusted Residual	-1.3	1.4	-.2	
HAMBLEN	Count	20.0	13.0	37.0	70.0
	Expected Count	13.1	14.6	42.3	70.0
	Adjusted Residual	2.1	-.5	-1.3	
HAMILTON	Count	76.0	94.0	236.0	406.0
	Expected Count	75.7	85.0	245.3	406.0
	Adjusted Residual	.0	1.1	-1.0	
HANCOCK	Count	2.0	.0	.0	2.0
	Expected Count	.4	.4	1.2	2.0
	Adjusted Residual	3.0	-.7	-1.7	
HARDEMAN	Count	.0	6.0	16.0	22.0
	Expected Count	4.1	4.6	13.3	22.0
	Adjusted Residual	-2.2	.7	1.2	
HARDIN	Count	2.0	3.0	4.0	9.0
	Expected Count	1.7	1.9	5.4	9.0
	Adjusted Residual	.3	.9	-1.0	
HAWKINS	Count	8.0	19.0	39.0	66.0
	Expected Count	12.3	13.8	39.9	66.0
	Adjusted Residual	-1.4	1.6	-.2	
HAYWOOD	Count	6.0	1.0	14.0	21.0
	Expected Count	3.9	4.4	12.7	21.0
	Adjusted Residual	1.2	-1.8	.6	
HENDERSON	Count	5.0	.0	10.0	15.0
	Expected Count	2.8	3.1	9.1	15.0
	Adjusted Residual	1.5	-2.0	.5	
HENRY	Count	7.0	7.0	26.0	40.0
	Expected Count	7.5	8.4	24.2	40.0
	Adjusted Residual	-.2	-.5	.6	

Table 4.4A & Table 4.5A Continued

TN County of Injury * Able to Return to Prior Employment Crosstabulation

		Able to Return to Prior Employment			Total
		N/A	NO	YES	
HICKMAN	Count	1.0	.0	9.0	10.0
	Expected Count	1.9	2.1	6.0	10.0
	Adjusted Residual	-.7	-1.6	1.9	
HOUSTON	Count	.0	3.0	3.0	6.0
	Expected Count	1.1	1.3	3.6	6.0
	Adjusted Residual	-1.2	1.8	-.5	
HUMPHREYS	Count	5.0	2.0	5.0	12.0
	Expected Count	2.2	2.5	7.3	12.0
	Adjusted Residual	2.0	-.4	-1.3	
JACKSON	Count	1.0	.0	4.0	5.0
	Expected Count	.9	1.0	3.0	5.0
	Adjusted Residual	.1	-1.2	.9	
JEFFERSON	Count	6.0	7.0	16.0	29.0
	Expected Count	5.4	6.1	17.5	29.0
	Adjusted Residual	.3	.4	-.6	
JOHNSON	Count	.0	2.0	5.0	7.0
	Expected Count	1.3	1.5	4.2	7.0
	Adjusted Residual	-1.3	.5	.6	
KNOX	Count	118.0	98.0	298.0	514.0
	Expected Count	95.8	107.6	310.6	514.0
	Adjusted Residual	2.6	-1.1	-1.2	
LAKE	Count	.0	.0	2.0	2.0
	Expected Count	.4	.4	1.2	2.0
	Adjusted Residual	-.7	-.7	1.1	
LAUDERDALE	Count	5.0	4.0	19.0	28.0
	Expected Count	5.2	5.9	16.9	28.0
	Adjusted Residual	-.1	-.9	.8	
LAWRENCE	Count	5.0	9.0	22.0	36.0
	Expected Count	6.7	7.5	21.8	36.0
	Adjusted Residual	-.7	.6	.1	

Table 4.4A & Table 4.5A Continued

TN County of Injury * Able to Return to Prior Employment Crosstabulation

		Able to Return to Prior Employment			Total
		N/A	NO	YES	
LEWIS	Count	2.0	4.0	7.0	13.0
	Expected Count	2.4	2.7	7.9	13.0
	Adjusted Residual	-.3	.9	-.5	
LINCOLN	Count	5.0	6.0	10.0	21.0
	Expected Count	3.9	4.4	12.7	21.0
	Adjusted Residual	.6	.9	-1.2	
LOUDON	Count	4.0	4.0	22.0	30.0
	Expected Count	5.6	6.3	18.1	30.0
	Adjusted Residual	-.7	-1.0	1.4	
MACON	Count	6.0	3.0	10.0	19.0
	Expected Count	3.5	4.0	11.5	19.0
	Adjusted Residual	1.4	-.6	-.7	
MADISON	Count	32.0	21.0	112.0	165.0
	Expected Count	30.8	34.5	99.7	165.0
	Adjusted Residual	.2	-2.6	2.0	
MARION	Count	4.0	5.0	16.0	25.0
	Expected Count	4.7	5.2	15.1	25.0
	Adjusted Residual	-.3	-.1	.4	
MARSHALL	Count	5.0	5.0	16.0	26.0
	Expected Count	4.8	5.4	15.7	26.0
	Adjusted Residual	.1	-.2	.1	
MAURY	Count	22.0	21.0	64.0	107.0
	Expected Count	20.0	22.4	64.7	107.0
	Adjusted Residual	.5	-.3	-.1	
MCMINN	Count	10.0	17.0	25.0	52.0
	Expected Count	9.7	10.9	31.4	52.0
	Adjusted Residual	.1	2.1	-1.8	
MCNAIRY	Count	6.0	2.0	21.0	29.0
	Expected Count	5.4	6.1	17.5	29.0
	Adjusted Residual	.3	-1.9	1.3	

Table 4.4A & Table 4.5A Continued

TN County of Injury * Able to Return to Prior Employment Crosstabulation

		Able to Return to Prior Employment			Total
		N/A	NO	YES	
MEIGS	Count	.0	2.0	3.0	5.0
	Expected Count	.9	1.0	3.0	5.0
	Adjusted Residual	-1.1	1.0	.0	
MONROE	Count	7.0	12.0	25.0	44.0
	Expected Count	8.2	9.2	26.6	44.0
	Adjusted Residual	-.5	1.0	-.5	
MONTGOMERY	Count	20.0	11.0	58.0	89.0
	Expected Count	16.6	18.6	53.8	89.0
	Adjusted Residual	.9	-2.0	.9	
MOORE	Count	1.0	.0	.0	1.0
	Expected Count	.2	.2	.6	1.0
	Adjusted Residual	2.1	-.5	-1.2	
MORGAN	Count	1.0	2.0	4.0	7.0
	Expected Count	1.3	1.5	4.2	7.0
	Adjusted Residual	-.3	.5	-.2	
OBION	Count	37.0	7.0	61.0	105.0
	Expected Count	19.6	22.0	63.4	105.0
	Adjusted Residual	4.4	-3.6	-.5	
OUT-OF-STATE	Count	51.0	101.0	167.0	319.0
	Expected Count	59.5	66.8	192.8	319.0
	Adjusted Residual	-1.3	4.8	-3.0	
OVERTON	Count	.0	3.0	3.0	6.0
	Expected Count	1.1	1.3	3.6	6.0
	Adjusted Residual	-1.2	1.8	-.5	
PERRY	Count	1.0	3.0	7.0	11.0
	Expected Count	2.1	2.3	6.6	11.0
	Adjusted Residual	-.8	.5	.2	
PICKETT	Count	1.0	.0	2.0	3.0
	Expected Count	.6	.6	1.8	3.0
	Adjusted Residual	.7	-.9	.2	

Table 4.4A & Table 4.5A Continued

TN County of Injury * Able to Return to Prior Employment Crosstabulation

		Able to Return to Prior Employment			Total
		N/A	NO	YES	
POLK	Count	2.0	1.0	4.0	7.0
	Expected Count	1.3	1.5	4.2	7.0
	Adjusted Residual	.7	-.4	-.2	
PUTNAM	Count	13.0	14.0	41.0	68.0
	Expected Count	12.7	14.2	41.1	68.0
	Adjusted Residual	.1	-.1	.0	
RHEA	Count	6.0	7.0	18.0	31.0
	Expected Count	5.8	6.5	18.7	31.0
	Adjusted Residual	.1	.2	-.3	
ROANE	Count	18.0	15.0	37.0	70.0
	Expected Count	13.1	14.6	42.3	70.0
	Adjusted Residual	1.5	.1	-1.3	
ROBERTSON	Count	5.0	7.0	31.0	43.0
	Expected Count	8.0	9.0	26.0	43.0
	Adjusted Residual	-1.2	-.8	1.6	
RUTHERFORD	Count	56.0	69.0	197.0	322.0
	Expected Count	60.0	67.4	194.6	322.0
	Adjusted Residual	-.6	.2	.3	
SCOTT	Count	9.0	22.0	24.0	55.0
	Expected Count	10.3	11.5	33.2	55.0
	Adjusted Residual	-.4	3.5	-2.6	
SEQUATCHIE	Count	2.0	1.0	7.0	10.0
	Expected Count	1.9	2.1	6.0	10.0
	Adjusted Residual	.1	-.9	.6	
SEVIER	Count	24.0	21.0	59.0	104.0
	Expected Count	19.4	21.8	62.8	104.0
	Adjusted Residual	1.2	-.2	-.8	
SHELBY	Count	99.0	93.0	504.0	696.0
	Expected Count	129.8	145.7	420.6	696.0
	Adjusted Residual	-3.2	-5.2	6.9	

Table 4.4A & Table 4.5A Continued

TN County of Injury * Able to Return to Prior Employment Crosstabulation

		Able to Return to Prior Employment			Total
		N/A	NO	YES	
SMITH	Count	3.0	2.0	8.0	13.0
	Expected Count	2.4	2.7	7.9	13.0
	Adjusted Residual	.4	-.5	.1	
STEWART	Count	3.0	4.0	10.0	17.0
	Expected Count	3.2	3.6	10.3	17.0
	Adjusted Residual	-.1	.3	-.1	
SULLIVAN	Count	25.0	59.0	107.0	191.0
	Expected Count	35.6	40.0	115.4	191.0
	Adjusted Residual	-2.0	3.4	-1.3	
SUMNER	Count	27.0	18.0	76.0	121.0
	Expected Count	22.6	25.3	73.1	121.0
	Adjusted Residual	1.0	-1.7	.5	
TIPTON	Count	.0	3.0	18.0	21.0
	Expected Count	3.9	4.4	12.7	21.0
	Adjusted Residual	-2.2	-.7	2.4	
TROUSDALE	Count	1.0	.0	1.0	2.0
	Expected Count	.4	.4	1.2	2.0
	Adjusted Residual	1.1	-.7	-.3	
UNICOI	Count	4.0	6.0	7.0	17.0
	Expected Count	3.2	3.6	10.3	17.0
	Adjusted Residual	.5	1.5	-1.6	
UNION	Count	.0	4.0	7.0	11.0
	Expected Count	2.1	2.3	6.6	11.0
	Adjusted Residual	-1.6	1.3	.2	
WARREN	Count	16.0	4.0	22.0	42.0
	Expected Count	7.8	8.8	25.4	42.0
	Adjusted Residual	3.2	-1.8	-1.1	
WASHINGTON	Count	28.0	44.0	84.0	156.0
	Expected Count	29.1	32.6	94.3	156.0
	Adjusted Residual	-.2	2.3	-1.7	

Table 4.4A & Table 4.5A Continued

TN County of Injury * Able to Return to Prior Employment Crosstabulation

			Able to Return to Prior Employment			Total
			N/A	NO	YES	
	WAYNE	Count	3.0	3.0	7.0	13.0
		Expected Count	2.4	2.7	7.9	13.0
		Adjusted Residual	.4	.2	-.5	
	WEAKLEY	Count	5.0	8.0	22.0	35.0
		Expected Count	6.5	7.3	21.1	35.0
		Adjusted Residual	-.7	.3	.3	
	WHITE	Count	1.0	2.0	10.0	13.0
		Expected Count	2.4	2.7	7.9	13.0
		Adjusted Residual	-1.0	-.5	1.2	
	WILLIAMSON	Count	16.0	14.0	56.0	86.0
		Expected Count	16.0	18.0	52.0	86.0
		Adjusted Residual	.0	-1.1	.9	
	WILSON	Count	13.0	19.0	56.0	88.0
		Expected Count	16.4	18.4	53.2	88.0
		Adjusted Residual	-.9	.2	.6	
Total		Count	1193.0	1339.0	3866.0	6398.0
		Expected Count	1193.0	1339.0	3866.0	6398.0

Table 4.6A & Table 4.7A

Crosstabulation of the Variables Able to Return-to-Work and District

District * Able to Return to Prior Employment

			Able to Return to Prior Employment			Total
			N/A	NO	YES	
District	1	Count	35	65	104	204
		Expected Count	38.3	41.5	124.2	204.0
		Adjusted Residual	-.6	4.2	-2.9	
	2	Count	25	59	107	191
		Expected Count	35.9	38.8	116.3	191.0
		Adjusted Residual	-2.1	3.7	-1.4	
	3	Count	40	51	118	209
		Expected Count	39.3	42.5	127.2	209.0
		Adjusted Residual	.1	1.5	-1.3	
	4	Count	38	49	102	189
		Expected Count	35.5	38.4	115.1	189.0
		Adjusted Residual	.5	1.9	-2.0	
	5	Count	20	28	46	94
		Expected Count	17.7	19.1	57.2	94.0
		Adjusted Residual	.6	2.3	-2.4	
	6	Count	118	97	298	513
		Expected Count	96.4	104.3	312.3	513.0
		Adjusted Residual	2.5	-.8	-1.4	
	7	Count	26	28	100	154
		Expected Count	28.9	31.3	93.8	154.0
		Adjusted Residual	-.6	-.7	1.0	
	8	Count	30	53	75	158
		Expected Count	29.7	32.1	96.2	158.0
		Adjusted Residual	.1	4.2	-3.5	
	9	Count	23	23	66	112
		Expected Count	21.0	22.8	68.2	112.0
		Adjusted Residual	.5	.1	-.4	

Table 4.6A & Table 4.7A Continued

District * Able to Return to Prior Employment

		Able to Return to Prior Employment			Total
		N/A	NO	YES	
10	Count	30	58	108	196
	Expected Count	36.8	39.8	119.3	196.0
	Adjusted Residual	-1.3	3.3	-1.7	
11	Count	75	92	236	403
	Expected Count	75.7	81.9	245.3	403.0
	Adjusted Residual	-.1	1.3	-1.0	
12	Count	20	29	70	119
	Expected Count	22.4	24.2	72.4	119.0
	Adjusted Residual	-.6	1.1	-.5	
13	Count	25	35	93	153
	Expected Count	28.8	31.1	93.1	153.0
	Adjusted Residual	-.8	.8	.0	
14	Count	16	15	50	81
	Expected Count	15.2	16.5	49.3	81.0
	Adjusted Residual	.2	-.4	.2	
15	Count	24	24	79	127
	Expected Count	23.9	25.8	77.3	127.0
	Adjusted Residual	.0	-.4	.3	
16	Count	58	69	201	328
	Expected Count	61.6	66.7	199.7	328.0
	Adjusted Residual	-.5	.3	.2	
17	Count	17	18	47	82
	Expected Count	15.4	16.7	49.9	82.0
	Adjusted Residual	.5	.4	-.7	
18	Count	27	18	75	120
	Expected Count	22.6	24.4	73.1	120.0
	Adjusted Residual	1.0	-1.5	.4	
19	Count	25	18	89	132
	Expected Count	24.8	26.8	80.4	132.0
	Adjusted Residual	.0	-1.9	1.6	

Table 4.6A & Table 4.7A Continued

District * Able to Return to Prior Employment

		Able to Return to Prior Employment			Total
		N/A	NO	YES	
20	Count	125	131	399	655
	Expected Count	123.1	133.1	398.8	655.0
	Adjusted Residual	.2	-.2	.0	
21	Count	20	21	78	119
	Expected Count	22.4	24.2	72.4	119.0
	Adjusted Residual	-.6	-.7	1.1	
22	Count	38	39	107	184
	Expected Count	34.6	37.4	112.0	184.0
	Adjusted Residual	.7	.3	-.8	
23	Count	23	23	59	105
	Expected Count	19.7	21.3	63.9	105.0
	Adjusted Residual	.8	.4	-1.0	
24	Count	21	22	66	109
	Expected Count	20.5	22.2	66.4	109.0
	Adjusted Residual	.1	.0	-.1	
25	Count	13	17	80	110
	Expected Count	20.7	22.4	67.0	110.0
	Adjusted Residual	-1.9	-1.3	2.6	
26	Count	41	21	129	191
	Expected Count	35.9	38.8	116.3	191.0
	Adjusted Residual	1.0	-3.3	1.9	
27	Count	42	15	83	140
	Expected Count	26.3	28.5	85.2	140.0
	Adjusted Residual	3.4	-2.9	-.4	
28	Count	18	12	74	104
	Expected Count	19.5	21.1	63.3	104.0
	Adjusted Residual	-.4	-2.2	2.2	
29	Count	13	7	31	51
	Expected Count	9.6	10.4	31.0	51.0
	Adjusted Residual	1.2	-1.2	.0	

Table 4.6A & Table 4.7A Continued

District * Able to Return to Prior Employment

			Able to Return to Prior Employment			Total
			N/A	NO	YES	
	30	Count	99	93	504	696
		Expected Count	130.8	141.5	423.7	696.0
		Adjusted Residual	-3.3	-4.9	6.6	
	31	Count	16	4	22	42
		Expected Count	7.9	8.5	25.6	42.0
		Adjusted Residual	3.2	-1.7	-1.1	
Total		Count	1141	1234	3696	6071
		Expected Count	1141.0	1234.0	3696.0	6071.0

Table 4.8A & Table 4.9A

Crosstabulation of the Variables Able to Return-to-Work and Geographic Region

Able to Return to Prior Employment * Geographic Region

			Geographic Region			Total
			East = 1	Middle = 2	West = 3	
Able to Return to Prior Employment	N/A	Count	462	434	245	1141
		Expected Count	459.5	419.9	261.6	1141.0
		Adjusted Residual	.2	1.0	-1.3	
	NO	Count	607	443	184	1234
		Expected Count	497.0	454.1	282.9	1234.0
		Adjusted Residual	7.2	-.7	-7.5	
	YES	Count	1376	1357	963	3696
		Expected Count	1488.5	1360.1	847.4	3696.0
		Adjusted Residual	-6.0	-.2	7.2	
Total		Count	2445	2234	1392	6071
		Expected Count	2445.0	2234.0	1392.0	6071.0

Table 4.13A

Education Level * Geographic Region Crosstabulation

			Geographic Region			Total
			East = 1	Middle = 2	West = 3	
Education Level		Count	504	675	313	1492
		Expected Count	600.9	549.0	342.1	1492.0
		Adjusted Residual	-5.9	7.8	-2.1	
	BS/BA	Count	61	76	34	171
		Expected Count	68.9	62.9	39.2	171.0
		Adjusted Residual	-1.2	2.1	-1.0	
	GED	Count	195	156	81	432
		Expected Count	174.0	159.0	99.1	432.0
		Adjusted Residual	2.1	-.3	-2.1	
	Graduate Degree	Count	25	23	15	63
		Expected Count	25.4	23.2	14.4	63.0
		Adjusted Residual	-.1	.0	.2	
	High School Diploma	Count	844	642	534	2020
		Expected Count	813.5	743.3	463.2	2020.0
		Adjusted Residual	1.7	-5.7	4.6	
	Less Than 9th Grade	Count	118	93	44	255
		Expected Count	102.7	93.8	58.5	255.0
		Adjusted Residual	2.0	-.1	-2.2	
	Some College	Count	342	270	217	829
		Expected Count	333.9	305.1	190.1	829.0
		Adjusted Residual	.6	-2.7	2.4	
	Some High School	Count	356	299	154	809
		Expected Count	325.8	297.7	185.5	809.0
		Adjusted Residual	2.3	.1	-2.8	
Total		Count	2445	2234	1392	6071
		Expected Count	2445.0	2234.0	1392.0	6071.0

Table 4.16A

Tennessee County of Injury * Surgery Performed Crosstabulation

			Surgery Performed			Total
			N/A	NO	YES	
TN County of Injury	Anderson	Count	3	104	47	154
		Expected Count	9.7	77.3	67.0	154.0
		Adjusted Residual	-2.2	4.4	-3.3	
	Bedford	Count	4	13	18	35
		Expected Count	2.2	17.6	15.2	35.0
		Adjusted Residual	1.3	-1.5	.9	
	Benton	Count	0	18	8	26
		Expected Count	1.6	13.1	11.3	26.0
		Adjusted Residual	-1.3	1.9	-1.3	
	Bledsoe	Count	0	2	2	4
		Expected Count	.3	2.0	1.7	4.0
		Adjusted Residual	-.5	.0	.3	
	Blount	Count	4	59	31	94
		Expected Count	5.9	47.2	40.9	94.0
		Adjusted Residual	-.8	2.5	-2.1	
	Bradley	Count	5	50	38	93
		Expected Count	5.8	46.7	40.5	93.0
		Adjusted Residual	-.4	.7	-.5	
	Campbell	Count	4	40	12	56
		Expected Count	3.5	28.1	24.4	56.0
		Adjusted Residual	.3	3.2	-3.4	
	Cannon	Count	0	4	2	6
		Expected Count	.4	3.0	2.6	6.0
		Adjusted Residual	-.6	.8	-.5	
	Carroll	Count	3	11	11	25
		Expected Count	1.6	12.6	10.9	25.0
		Adjusted Residual	1.2	-.6	.0	
	Carter	Count	2	10	12	24

Table 4.16A Continued

TN County of Injury * Surgery Performed Crosstabulation

		Surgery Performed			Total
		N/A	NO	YES	
Cheatham	Count	6	9	15	30
	Expected Count	1.9	15.1	13.1	30.0
	Adjusted Residual	3.1	-2.2	.7	
Chester	Count	0	5	6	11
	Expected Count	.7	5.5	4.8	11.0
	Adjusted Residual	-.9	-.3	.7	
Claiborne	Count	2	15	10	27
	Expected Count	1.7	13.6	11.8	27.0
	Adjusted Residual	.2	.6	-.7	
Cocke	Count	4	30	11	45
	Expected Count	2.8	22.6	19.6	45.0
	Adjusted Residual	.7	2.2	-2.6	
Coffee	Count	4	41	36	81
	Expected Count	5.1	40.7	35.3	81.0
	Adjusted Residual	-.5	.1	.2	
Crockett	Count	0	7	7	14
	Expected Count	.9	7.0	6.1	14.0
	Adjusted Residual	-1.0	.0	.5	
Cumberland	Count	4	20	21	45
	Expected Count	2.8	22.6	19.6	45.0
	Adjusted Residual	.7	-.8	.4	
Davidson	Count	51	296	308	655
	Expected Count	41.1	328.8	285.1	655.0
	Adjusted Residual	1.7	-2.7	1.9	
Decatur	Count	0	5	4	9
	Expected Count	.6	4.5	3.9	9.0
	Adjusted Residual	-.8	.3	.1	
DeKalb	Count	2	7	10	19
	Expected Count	1.2	9.5	8.3	19.0
	Adjusted Residual	.8	-1.2	.8	

Table 4.16A Continued

TN County of Injury * Surgery Performed Crosstabulation

		Surgery Performed			Total
		N/A	NO	YES	
Dickson	Count	3	17	20	40
	Expected Count	2.5	20.1	17.4	40.0
	Adjusted Residual	.3	-1.0	.8	
Dyer	Count	1	20	28	49
	Expected Count	3.1	24.6	21.3	49.0
	Adjusted Residual	-1.2	-1.3	1.9	
Fayette	Count	0	2	8	10
	Expected Count	.6	5.0	4.4	10.0
	Adjusted Residual	-.8	-1.9	2.3	
Fentress	Count	1	4	4	9
	Expected Count	.6	4.5	3.9	9.0
	Adjusted Residual	.6	-.3	.1	
Franklin	Count	4	18	21	43
	Expected Count	2.7	21.6	18.7	43.0
	Adjusted Residual	.8	-1.1	.7	
Gibson	Count	1	42	26	69
	Expected Count	4.3	34.6	30.0	69.0
	Adjusted Residual	-1.7	1.8	-1.0	
Giles	Count	2	12	14	28
	Expected Count	1.8	14.1	12.2	28.0
	Adjusted Residual	.2	-.8	.7	
Grainger	Count	1	7	3	11
	Expected Count	.7	5.5	4.8	11.0
	Adjusted Residual	.4	.9	-1.1	
Greene	Count	5	39	27	71
	Expected Count	4.4	35.6	30.9	71.0
	Adjusted Residual	.3	.8	-.9	
Grundy	Count	0	4	3	7
	Expected Count	.4	3.5	3.0	7.0
	Adjusted Residual	-.7	.4	.0	

Table 4.16A Continued

TN County of Injury * Surgery Performed Crosstabulation

		Surgery Performed			Total
		N/A	NO	YES	
Hamblen	Count	5	40	25	70
	Expected Count	4.4	35.1	30.5	70.0
	Adjusted Residual	.3	1.2	-1.3	
Hamilton	Count	26	234	145	405
	Expected Count	25.4	203.3	176.3	405.0
	Adjusted Residual	.1	3.2	-3.2	
Hancock	Count	1	1	0	2
	Expected Count	.1	1.0	.9	2.0
	Adjusted Residual	2.6	.0	-1.2	
Hardeman	Count	1	11	10	22
	Expected Count	1.4	11.0	9.6	22.0
	Adjusted Residual	-.3	.0	.2	
Hardin	Count	1	2	6	9
	Expected Count	.6	4.5	3.9	9.0
	Adjusted Residual	.6	-1.7	1.4	
Hawkins	Count	6	33	27	66
	Expected Count	4.1	33.1	28.7	66.0
	Adjusted Residual	1.0	.0	-.4	
Haywood	Count	2	9	10	21
	Expected Count	1.3	10.5	9.1	21.0
	Adjusted Residual	.6	-.7	.4	
Henderson	Count	1	11	3	15
	Expected Count	.9	7.5	6.5	15.0
	Adjusted Residual	.1	1.8	-1.8	
Henry	Count	2	22	16	40
	Expected Count	2.5	20.1	17.4	40.0
	Adjusted Residual	-.3	.6	-.5	
Hickman	Count	0	6	4	10
	Expected Count	.6	5.0	4.4	10.0
	Adjusted Residual	-.8	.6	-.2	

Table 4.16A Continued

TN County of Injury * Surgery Performed Crosstabulation

		Surgery Performed			Total
		N/A	NO	YES	
Houston	Count	1	3	2	6
	Expected Count	.4	3.0	2.6	6.0
	Adjusted Residual	1.1	.0	-.5	
Humphreys	Count	1	9	2	12
	Expected Count	.8	6.0	5.2	12.0
	Adjusted Residual	.3	1.7	-1.9	
Jackson	Count	2	1	2	5
	Expected Count	.3	2.5	2.2	5.0
	Adjusted Residual	3.1	-1.4	-.2	
Jefferson	Count	1	17	11	29
	Expected Count	1.8	14.6	12.6	29.0
	Adjusted Residual	-.6	.9	-.6	
Johnson	Count	0	4	3	7
	Expected Count	.4	3.5	3.0	7.0
	Adjusted Residual	-.7	.4	.0	
Knox	Count	30	300	184	514
	Expected Count	32.2	258.0	223.7	514.0
	Adjusted Residual	-.4	3.9	-3.7	
Lake	Count	0	2	0	2
	Expected Count	.1	1.0	.9	2.0
	Adjusted Residual	-.4	1.4	-1.2	
Lauderdale	Count	3	9	16	28
	Expected Count	1.8	14.1	12.2	28.0
	Adjusted Residual	1.0	-1.9	1.5	
Lawrence	Count	3	18	15	36
	Expected Count	2.3	18.1	15.7	36.0
	Adjusted Residual	.5	.0	-.2	
Lewis	Count	2	6	5	13
	Expected Count	.8	6.5	5.7	13.0
	Adjusted Residual	1.4	-.3	-.4	

Table 4.16A Continued

TN County of Injury * Surgery Performed Crosstabulation

		Surgery Performed			Total
		N/A	NO	YES	
Lincoln	Count	1	12	8	21
	Expected Count	1.3	10.5	9.1	21.0
	Adjusted Residual	-.3	.6	-.5	
Loudon	Count	0	17	13	30
	Expected Count	1.9	15.1	13.1	30.0
	Adjusted Residual	-1.4	.7	.0	
Macon	Count	6	7	6	19
	Expected Count	1.2	9.5	8.3	19.0
	Adjusted Residual	4.6	-1.2	-1.1	
Madison	Count	5	99	61	165
	Expected Count	10.3	82.8	71.8	165.0
	Adjusted Residual	-1.7	2.5	-1.7	
Marion	Count	5	10	10	25
	Expected Count	1.6	12.6	10.9	25.0
	Adjusted Residual	2.8	-1.0	-.4	
Marshall	Count	2	11	13	26
	Expected Count	1.6	13.1	11.3	26.0
	Adjusted Residual	.3	-.8	.7	
Maury	Count	7	53	47	107
	Expected Count	6.7	53.7	46.6	107.0
	Adjusted Residual	.1	-.1	.1	
McMinn	Count	4	23	25	52
	Expected Count	3.3	26.1	22.6	52.0
	Adjusted Residual	.4	-.9	.7	
McNairy	Count	2	14	13	29
	Expected Count	1.8	14.6	12.6	29.0
	Adjusted Residual	.1	-.2	.1	
Meigs	Count	0	3	2	5
	Expected Count	.3	2.5	2.2	5.0
	Adjusted Residual	-.6	.4	-.2	

Table 4.16A Continued

TN County of Injury * Surgery Performed Crosstabulation

		Surgery Performed			Total
		N/A	NO	YES	
Monroe	Count	5	16	23	44
	Expected Count	2.8	22.1	19.2	44.0
	Adjusted Residual	1.4	-1.8	1.2	
Montgomery	Count	4	60	25	89
	Expected Count	5.6	44.7	38.7	89.0
	Adjusted Residual	-.7	3.3	-3.0	
Moore	Count	0	0	1	1
	Expected Count	.1	.5	.4	1.0
	Adjusted Residual	-.3	-1.0	1.1	
Morgan	Count	0	5	2	7
	Expected Count	.4	3.5	3.0	7.0
	Adjusted Residual	-.7	1.1	-.8	
Obion	Count	8	30	67	105
	Expected Count	6.6	52.7	45.7	105.0
	Adjusted Residual	.6	-4.5	4.2	
Out-of-State	Count	16	148	155	319
	Expected Count	20.0	160.1	138.9	319.0
	Adjusted Residual	-.9	-1.4	1.9	
Overton	Count	0	2	4	6
	Expected Count	.4	3.0	2.6	6.0
	Adjusted Residual	-.6	-.8	1.1	
Perry	Count	0	6	5	11
	Expected Count	.7	5.5	4.8	11.0
	Adjusted Residual	-.9	.3	.1	
Pickett	Count	0	2	1	3
	Expected Count	.2	1.5	1.3	3.0
	Adjusted Residual	-.4	.6	-.4	
Polk	Count	0	4	3	7
	Expected Count	.4	3.5	3.0	7.0
	Adjusted Residual	-.7	.4	.0	

Table 4.16A Continued

TN County of Injury * Surgery Performed Crosstabulation

		Surgery Performed			Total
		N/A	NO	YES	
Putnam	Count	5	31	32	68
	Expected Count	4.3	34.1	29.6	68.0
	Adjusted Residual	.4	-.8	.6	
Rhea	Count	2	21	8	31
	Expected Count	1.9	15.6	13.5	31.0
	Adjusted Residual	.0	2.0	-2.0	
Roane	Count	8	38	24	70
	Expected Count	4.4	35.1	30.5	70.0
	Adjusted Residual	1.8	.7	-1.6	
Robertson	Count	2	23	18	43
	Expected Count	2.7	21.6	18.7	43.0
	Adjusted Residual	-.4	.4	-.2	
Rutherford	Count	25	114	183	322
	Expected Count	20.2	161.7	140.2	322.0
	Adjusted Residual	1.1	-5.5	4.9	
Scott	Count	3	33	19	55
	Expected Count	3.4	27.6	23.9	55.0
	Adjusted Residual	-.2	1.5	-1.3	
Sequatchie	Count	0	7	3	10
	Expected Count	.6	5.0	4.4	10.0
	Adjusted Residual	-.8	1.3	-.9	
Sevier	Count	5	67	32	104
	Expected Count	6.5	52.2	45.3	104.0
	Adjusted Residual	-.6	2.9	-2.6	
Shelby	Count	31	302	363	696
	Expected Count	43.6	349.4	303.0	696.0
	Adjusted Residual	-2.1	-3.8	4.9	
Smith	Count	1	10	2	13
	Expected Count	.8	6.5	5.7	13.0
	Adjusted Residual	.2	1.9	-2.0	

Table 4.16A Continued

TN County of Injury * Surgery Performed Crosstabulation

		Surgery Performed			Total
		N/A	NO	YES	
Stewart	Count	2	7	8	17
	Expected Count	1.1	8.5	7.4	17.0
	Adjusted Residual	.9	-.7	.3	
Sullivan	Count	9	111	71	191
	Expected Count	12.0	95.9	83.1	191.0
	Adjusted Residual	-.9	2.2	-1.8	
Sumner	Count	11	49	61	121
	Expected Count	7.6	60.7	52.7	121.0
	Adjusted Residual	1.3	-2.2	1.5	
Tipton	Count	0	4	17	21
	Expected Count	1.3	10.5	9.1	21.0
	Adjusted Residual	-1.2	-2.9	3.5	
Trousdale	Count	0	2	0	2
	Expected Count	.1	1.0	.9	2.0
	Adjusted Residual	-.4	1.4	-1.2	
Unicoi	Count	4	8	5	17
	Expected Count	1.1	8.5	7.4	17.0
	Adjusted Residual	2.9	-.3	-1.2	
Union	Count	0	3	8	11
	Expected Count	.7	5.5	4.8	11.0
	Adjusted Residual	-.9	-1.5	2.0	
Warren	Count	8	14	20	42
	Expected Count	2.6	21.1	18.3	42.0
	Adjusted Residual	3.4	-2.2	.5	
Washington	Count	5	81	70	156
	Expected Count	9.8	78.3	67.9	156.0
	Adjusted Residual	-1.6	.4	.3	
Wayne	Count	1	8	4	13
	Expected Count	.8	6.5	5.7	13.0
	Adjusted Residual	.2	.8	-.9	

Table 4.16A Continued

TN County of Injury * Surgery Performed Crosstabulation

			Surgery Performed			Total
			N/A	NO	YES	
	Weakley	Count	0	19	16	35
		Expected Count	2.2	17.6	15.2	35.0
		Adjusted Residual	-1.5	.5	.3	
	White	Count	1	8	4	13
		Expected Count	.8	6.5	5.7	13.0
		Adjusted Residual	.2	.8	-.9	
	Williamson	Count	2	40	44	86
		Expected Count	5.4	43.2	37.4	86.0
		Adjusted Residual	-1.5	-.7	1.4	
	Wilson	Count	7	41	40	88
		Expected Count	5.5	44.2	38.3	88.0
		Adjusted Residual	.7	-.7	.4	
Total		Count	401	3212	2785	6398
		Expected Count	401.0	3212.0	2785.0	6398.0

Table 4.17A

Crosstabulation of the Variables Surgery and District

District * Surgery Performed Crosstabulation

			Surgery Performed			Total
			N/A	NO	YES	
District	1	Count	11	103	90	204
		Expected Count	12.9	102.8	88.3	204.0
		Adjusted Residual	-.6	.0	.2	
	2	Count	9	111	71	191
		Expected Count	12.1	96.2	82.6	191.0
		Adjusted Residual	-.9	2.2	-1.7	
	3	Count	17	113	79	209
		Expected Count	13.3	105.3	90.4	209.0
		Adjusted Residual	1.1	1.1	-1.6	
	4	Count	11	121	57	189
		Expected Count	12.0	95.2	81.8	189.0
		Adjusted Residual	-.3	3.8	-3.7	
	5	Count	4	59	31	94
		Expected Count	6.0	47.4	40.7	94.0
		Adjusted Residual	-.8	2.4	-2.0	
	6	Count	30	299	184	513
		Expected Count	32.5	258.5	222.0	513.0
		Adjusted Residual	-.5	3.7	-3.5	
	7	Count	3	104	47	154
		Expected Count	9.8	77.6	66.6	154.0
		Adjusted Residual	-2.3	4.3	-3.2	
	8	Count	10	95	53	158
		Expected Count	10.0	79.6	68.4	158.0
		Adjusted Residual	.0	2.5	-2.5	
	9	Count	8	63	41	112
		Expected Count	7.1	56.4	48.5	112.0
		Adjusted Residual	.4	1.3	-1.4	

Table 4.17A Continued

District * Surgery Performed Crosstabulation

		Surgery Performed			Total
		N/A	NO	YES	
10	Count	14	93	89	196
	Expected Count	12.4	98.8	84.8	196.0
	Adjusted Residual	.5	-.8	.6	
11	Count	26	233	144	403
	Expected Count	25.6	203.1	174.4	403.0
	Adjusted Residual	.1	3.1	-3.2	
12	Count	11	62	46	119
	Expected Count	7.5	60.0	51.5	119.0
	Adjusted Residual	1.3	.4	-1.0	
13	Count	12	69	72	153
	Expected Count	9.7	77.1	66.2	153.0
	Adjusted Residual	.8	-1.3	1.0	
14	Count	4	41	36	81
	Expected Count	5.1	40.8	35.0	81.0
	Adjusted Residual	-.5	.0	.2	
15	Count	16	61	50	127
	Expected Count	8.1	64.0	55.0	127.0
	Adjusted Residual	2.9	-.5	-.9	
16	Count	25	118	185	328
	Expected Count	20.8	165.3	141.9	328.0
	Adjusted Residual	1.0	-5.4	4.9	
17	Count	7	36	39	82
	Expected Count	5.2	41.3	35.5	82.0
	Adjusted Residual	.8	-1.2	.8	
18	Count	11	48	61	120
	Expected Count	7.6	60.5	51.9	120.0
	Adjusted Residual	1.3	-2.3	1.7	
19	Count	6	83	43	132
	Expected Count	8.4	66.5	57.1	132.0
	Adjusted Residual	-.9	2.9	-2.5	

Table 4.17A Continued

District * Surgery Performed Crosstabulation

		Surgery Performed			Total
		N/A	NO	YES	
20	Count	51	296	308	655
	Expected Count	41.5	330.0	283.4	655.0
	Adjusted Residual	1.6	-2.8	2.1	
21	Count	4	57	58	119
	Expected Count	7.5	60.0	51.5	119.0
	Adjusted Residual	-1.3	-.5	1.2	
22	Count	13	91	80	184
	Expected Count	11.7	92.7	79.6	184.0
	Adjusted Residual	.4	-.3	.1	
23	Count	13	45	47	105
	Expected Count	6.7	52.9	45.4	105.0
	Adjusted Residual	2.6	-1.6	.3	
24	Count	6	58	45	109
	Expected Count	6.9	54.9	47.2	109.0
	Adjusted Residual	-.4	.6	-.4	
25	Count	6	40	64	110
	Expected Count	7.0	55.4	47.6	110.0
	Adjusted Residual	-.4	-3.0	3.2	
26	Count	6	115	70	191
	Expected Count	12.1	96.2	82.6	191.0
	Adjusted Residual	-1.8	2.8	-1.9	
27	Count	8	49	83	140
	Expected Count	8.9	70.5	60.6	140.0
	Adjusted Residual	-.3	-3.7	3.9	
28	Count	3	58	43	104
	Expected Count	6.6	52.4	45.0	104.0
	Adjusted Residual	-1.5	1.1	-.4	
29	Count	1	22	28	51
	Expected Count	3.2	25.7	22.1	51.0
	Adjusted Residual	-1.3	-1.0	1.7	

Table 4.17A Continued

District * Surgery Performed Crosstabulation

			Surgery Performed			Total
			N/A	NO	YES	
	30	Count	31	302	363	696
		Expected Count	44.1	350.7	301.2	696.0
		Adjusted Residual	-2.2	-3.9	5.0	
	31	Count	8	14	20	42
		Expected Count	2.7	21.2	18.2	42.0
		Adjusted Residual	3.4	-2.2	.6	
Total		Count	385	3059	2627	6071
		Expected Count	385.0	3059.0	2627.0	6071.0

Table 4.18A

Crosstabulation of the Variables Surgery and Geographic Region

Geographic Region * Surgery Performed Crosstabulation

			Surgery Performed			Total
			N/A	NO	YES	
Geographic Region	1	Count	144	1411	890	2445
		Expected Count	155.1	1232.0	1058.0	2445.0
		Adjusted Residual	-1.2	9.4	-8.9	
	2	Count	181	1006	1047	2234
		Expected Count	141.7	1125.6	966.7	2234.0
		Adjusted Residual	4.3	-6.4	4.3	
	3	Count	60	642	690	1392
		Expected Count	88.3	701.4	602.3	1392.0
		Adjusted Residual	-3.5	-3.6	5.4	
Total		Count	385	3059	2627	6071
		Expected Count	385.0	3059.0	2627.0	6071.0

Table 4.19 A

Crosstabulation of the Variables Concluding Decision and Year of Injury

Concluding Decision * Year of Injury Crosstabulation

			Year of Injury				Total
			2000	2001	2002	2003	
Concluding Decision	Complaint Voluntary Dismissal	Count	16	30	47	17	110
		Expected Count(a)	23.9	35.6	31.1	19.4	110.0
		Adjusted Residual	-1.8	-1.1	3.4	-.6	
	Settlement Complaint Filed	Count	611	699	556	237	2103
		Expected Count(a)	456.2	680.1	595.3	371.4	2103.0
		Adjusted Residual	10.0	1.1	-2.3	-9.4	
	Settlement Complaint not Filed	Count	286	570	503	376	1735
		Expected Count(a)	376.4	561.1	491.1	306.4	1735.0
		Adjusted Residual	-6.2	.5	.7	5.1	
	Settlement Department of Labor	Count	403	704	646	482	2235
		Expected Count(a)	484.9	722.8	632.6	394.7	2235.0
		Adjusted Residual	-5.2	-1.1	.8	6.0	
	Trial	Count	72	66	59	18	215
		Expected Count(a)	46.6	69.5	60.9	38.0	215.0
		Adjusted Residual	4.3	-.5	-.3	-3.6	
Total		Count	1388	2069	1811	1130	6398
		Expected Count(a)	1388.0	2069.0	1811.0	1130.0	6398.0

a Complaint Voluntary Dismissal was merged with Settlement Department of Labor for statistical analysis therefore is not acknowledged here.

Table 4.20A

Crosstabulation of the Variables Concluding Decision and District

District * Concluding Decision Crosstabulation

			Concluding Decision				Total
			Settlement Complaint Filed	Settlement Complaint Not Filed	Settlement Department of Labor	Trial	
District	1	Count	29	12	161	2	204
		Expected Count	67.0	55.1	75.1	6.8	204.0
		Adjusted Residual	-5.8	-6.9	12.7	-1.9	
	2	Count	22	14	151	4	191
		Expected Count	62.8	51.6	70.3	6.4	191.0
		Adjusted Residual	-6.4	-6.2	12.3	-1.0	
	3	Count	43	30	131	5	209
		Expected Count	68.7	56.5	76.9	7.0	209.0
		Adjusted Residual	-3.8	-4.2	7.9	-.8	
	4	Count	41	33	107	8	189
		Expected Count	62.1	51.1	69.5	6.3	189.0
		Adjusted Residual	-3.3	-3.0	5.7	.7	
	5	Count	24	15	51	4	94
		Expected Count	30.9	25.4	34.6	3.1	94.0
		Adjusted Residual	-1.5	-2.4	3.5	.5	

Table 4.20A Continued

District * Concluding Decision Crosstabulation

		Concluding Decision				Total
		Settlement Complaint Filed	Settlement Complaint Not Filed	Settlement Department of Labor	Trial	
6	Count	166	81	254	12	513
	Expected Count	168.6	138.6	188.8	17.1	513.0
	Adjusted Residual	-.3	-6.0	6.2	-1.3	
7	Count	68	30	51	5	154
	Expected Count	50.6	41.6	56.7	5.1	154.0
	Adjusted Residual	3.0	-2.1	-1.0	-.1	
8	Count	78	18	58	4	158
	Expected Count	51.9	42.7	58.1	5.3	158.0
	Adjusted Residual	4.5	-4.5	.0	-.6	
9	Count	37	18	47	10	112
	Expected Count	36.8	30.3	41.2	3.7	112.0
	Adjusted Residual	.0	-2.6	1.1	3.3	
10	Count	90	52	48	6	196
	Expected Count	64.4	52.9	72.1	6.5	196.0
	Adjusted Residual	4.0	-.2	-3.6	-.2	

Table 4.20A Continued

District * Concluding Decision Crosstabulation

		Concluding Decision				Total
		Settlement Complaint Filed	Settlement Complaint Not Filed	Settlement Department of Labor	Trial	
11	Count	172	156	69	6	403
	Expected Count	132.4	108.9	148.3	13.4	403.0
	Adjusted Residual	4.3	5.5	-8.5	-2.1	
12	Count	56	35	23	5	119
	Expected Count	39.1	32.1	43.8	4.0	119.0
	Adjusted Residual	3.3	.6	-4.0	.5	
13	Count	75	51	22	5	153
	Expected Count	50.3	41.3	56.3	5.1	153.0
	Adjusted Residual	4.3	1.8	-5.8	.0	
14	Count	45	26	5	5	81
	Expected Count	26.6	21.9	29.8	2.7	81.0
	Adjusted Residual	4.4	1.0	-5.8	1.4	
15	Count	59	51	10	7	127
	Expected Count	41.7	34.3	46.7	4.2	127.0
	Adjusted Residual	3.3	3.4	-6.8	1.4	
16	Count	125	158	25	20	328
	Expected Count	107.8	88.6	120.7	10.9	328.0
	Adjusted Residual	2.1	8.9	-11.3	2.9	

Table 4.20A Continued

District * Concluding Decision Crosstabulation

		Concluding Decision				Total
		Settlement Complaint Filed	Settlement Complaint Not Filed	Settlement Department of Labor	Trial	
17	Count	26	38	17	1	82
	Expected Count	26.9	22.2	30.2	2.7	82.0
	Adjusted Residual	-.2	4.0	-3.0	-1.1	
18	Count	47	54	17	2	120
	Expected Count	39.4	32.4	44.2	4.0	120.0
	Adjusted Residual	1.5	4.5	-5.2	-1.0	
19	Count	52	48	29	3	132
	Expected Count	43.4	35.7	48.6	4.4	132.0
	Adjusted Residual	1.6	2.4	-3.6	-.7	
20	Count	260	301	81	13	655
	Expected Count	215.2	176.9	241.0	21.8	655.0
	Adjusted Residual	3.9	11.6	-13.7	-2.0	
21	Count	35	71	10	3	119
	Expected Count	39.1	32.1	43.8	4.0	119.0
	Adjusted Residual	-.8	8.1	-6.5	-.5	
22	Count	65	82	28	9	184
	Expected Count	60.5	49.7	67.7	6.1	184.0
	Adjusted Residual	.7	5.4	-6.2	1.2	

Table 4.20A Continued

District * Concluding Decision Crosstabulation

		Concluding Decision				Total
		Settlement Complaint Filed	Settlement Complaint Not Filed	Settlement Department of Labor	Trial	
23	Count	39	57	7	2	105
	Expected Count	34.5	28.4	38.6	3.5	105.0
	Adjusted Residual	.9	6.3	-6.5	-.8	
24	Count	41	16	43	9	109
	Expected Count	35.8	29.4	40.1	3.6	109.0
	Adjusted Residual	1.1	-2.9	.6	2.9	
25	Count	28	15	66	1	110
	Expected Count	36.1	29.7	40.5	3.7	110.0
	Adjusted Residual	-1.7	-3.2	5.1	-1.4	
26	Count	71	33	77	10	191
	Expected Count	62.8	51.6	70.3	6.4	191.0
	Adjusted Residual	1.3	-3.1	1.0	1.5	
27	Count	56	32	23	29	140
	Expected Count	46.0	37.8	51.5	4.7	140.0
	Adjusted Residual	1.8	-1.1	-5.1	11.6	
28	Count	27	16	55	6	104
	Expected Count	34.2	28.1	38.3	3.5	104.0
	Adjusted Residual	-1.5	-2.7	3.4	1.4	

Table 4.20A Continued

District * Concluding Decision Crosstabulation

			Concluding Decision				Total
			Settlement Complaint Filed	Settlement Complaint Not Filed	Settlement Department of Labor	Trial	
	29	Count	20	8	22	1	51
		Expected Count	16.8	13.8	18.8	1.7	51.0
		Adjusted Residual	1.0	-1.8	.9	-.5	
	30	Count	76	73	544	3	696
		Expected Count	228.7	188.0	256.1	23.2	696.0
		Adjusted Residual	-13.1	-10.4	24.0	-4.5	
	31	Count	22	16	2	2	42
		Expected Count	13.8	11.3	15.5	1.4	42.0
		Adjusted Residual	2.7	1.6	-4.3	.5	
Total		Count	1995	1640	2234	202	6071
		Expected Count	1995.0	1640.0	2234.0	202.0	6071.0

Table 4.21A

Crosstabulation of the Variables Concluding Decision and Geographic Region

Concluding Decision * Geographic Region Crosstabulation

			Geographic Region			Total
			East = 1	Middle = 2	West = 3	
Concluding Decision	Settlement Complaint Filed	Count	776	902	317	1995
		Expected Count	803.5	734.1	457.4	1995.0
		Adjusted Residual	-1.5	9.5	-9.1	
	Settlement Complaint Not Filed	Count	468	984	188	1640
		Expected Count	660.5	603.5	376.0	1640.0
		Adjusted Residual	-11.3	22.8	-12.9	
	Settlement Department of Labor	Count	1135	270	829	2234
		Expected Count	899.7	822.1	512.2	2234.0
		Adjusted Residual	12.8	-30.5	20.1	
	Trial	Count	66	78	58	202
		Expected Count	81.4	74.3	46.3	202.0
		Adjusted Residual	-2.2	.5	2.0	
Total		Count	2445	2234	1392	6071
		Expected Count	2445.0	2234.0	1392.0	6071.0

Table 4.11A

Crosstabulation of the Variables Education Level and Tennessee County of Injury

TN County of Injury * Education Level Crosstabulation

			Education Level							Total
			BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
TN County of Injury	Anderson	Count	7	15	4	67	0	27	17	154
		Expected Count	4.2	11.0	1.6	51.3	6.4	21.0	20.6	154.0
		Adjusted Residual	1.4	1.2	2.0	2.7	-2.6	1.4	-.9	
	Bedford	Count	1	1	0	12	1	1	10	35
		Expected Count	1.0	2.5	.4	11.7	1.5	4.8	4.7	35.0
		Adjusted Residual	.1	-1.0	-.6	.1	-.4	-1.9	2.6	
	Benton	Count	0	2	0	8	1	5	7	26
		Expected Count	.7	1.9	.3	8.7	1.1	3.5	3.5	26.0
		Adjusted Residual	-.9	.1	-.5	-.3	-.1	.8	2.0	
	Bledsoe	Count	0	0	0	0	0	0	0	4
		Expected Count	.1	.3	.0	1.3	.2	.5	.5	4.0
		Adjusted Residual	-.3	-.6	-.2	-1.4	-.4	-.8	-.8	
	Blount	Count	5	11	0	29	3	8	15	94
		Expected Count	2.6	6.7	1.0	31.3	3.9	12.8	12.6	94.0
		Adjusted Residual	1.6	1.7	-1.0	-.5	-.5	-1.5	.7	
	Bradley	Count	2	7	1	14	12	16	19	93
		Expected Count	2.5	6.7	.9	31.0	3.9	12.7	12.5	93.0
		Adjusted Residual	-.3	.1	.1	-3.8	4.3	1.0	2.0	
	Campbell	Count	1	5	1	15	5	7	10	56
		Expected Count	1.5	4.0	.6	18.7	2.3	7.6	7.5	56.0
		Adjusted Residual	-.4	.5	.6	-1.0	1.8	-.2	1.0	

Table 4.11A Continued

TN County of Injury * Education Level Crosstabulation

		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
Cannon	Count	0	0	0	2	0	2	1	6
	Expected Count	.2	.4	.1	2.0	.2	.8	.8	6.0
	Adjusted Residual	-.4	-.7	-.2	.0	-.5	1.4	.2	
Carroll	Count	1	1	0	5	0	3	5	25
	Expected Count	.7	1.8	.3	8.3	1.0	3.4	3.3	25.0
	Adjusted Residual	.4	-.6	-.5	-1.4	-1.0	-.2	1.0	
Carter	Count	0	2	0	13	2	2	5	24
	Expected Count	.7	1.7	.2	8.0	1.0	3.3	3.2	24.0
	Adjusted Residual	-.8	.2	-.5	2.2	1.0	-.8	1.1	
Cheatham	Count	1	1	0	5	2	1	7	30
	Expected Count	.8	2.2	.3	10.0	1.2	4.1	4.0	30.0
	Adjusted Residual	.2	-.8	-.6	-1.9	.7	-1.6	1.6	
Chester	Count	0	0	0	6	0	2	2	11
	Expected Count	.3	.8	.1	3.7	.5	1.5	1.5	11.0
	Adjusted Residual	-.6	-.9	-.3	1.5	-.7	.4	.5	
Claiborne	Count	1	1	1	12	1	3	4	27
	Expected Count	.7	1.9	.3	9.0	1.1	3.7	3.6	27.0
	Adjusted Residual	.3	-.7	1.4	1.2	-.1	-.4	.2	
Cocke	Count	0	0	0	14	7	8	11	45
	Expected Count	1.2	3.2	.5	15.0	1.9	6.1	6.0	45.0
	Adjusted Residual	-1.1	-1.9	-.7	-.3	3.8	.8	2.2	

Table 4.11A Continued

TN County of Injury * Education Level Crosstabulation

		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
Coffee	Count	0	10	0	22	5	10	9	81
	Expected Count	2.2	5.8	.8	27.0	3.4	11.0	10.8	81.0
	Adjusted Residual	-1.5	1.8	-.9	-1.2	.9	-.3	-.6	
Crockett	Count	1	2	0	4	0	3	3	14
	Expected Count	.4	1.0	.1	4.7	.6	1.9	1.9	14.0
	Adjusted Residual	1.0	1.0	-.4	-.4	-.8	.9	.9	
Cumberland	Count	2	5	0	7	5	5	9	45
	Expected Count	1.2	3.2	.5	15.0	1.9	6.1	6.0	45.0
	Adjusted Residual	.7	1.0	-.7	-2.5	2.3	-.5	1.3	
Davidson	Count	33	47	7	179	19	87	78	655
	Expected Count	17.8	47.0	6.7	218.4	27.2	89.2	87.7	655.0
	Adjusted Residual	3.9	.0	.1	-3.4	-1.7	-.3	-1.2	
Decatur	Count	0	1	0	4	1	0	1	9
	Expected Count	.2	.6	.1	3.0	.4	1.2	1.2	9.0
	Adjusted Residual	-.5	.5	-.3	.7	1.0	-1.2	-.2	
DeKalb	Count	2	1	0	4	2	2	5	19
	Expected Count	.5	1.4	.2	6.3	.8	2.6	2.5	19.0
	Adjusted Residual	2.1	-.3	-.4	-1.1	1.4	-.4	1.7	
Dickson	Count	2	2	0	9	0	4	6	40
	Expected Count	1.1	2.9	.4	13.3	1.7	5.4	5.4	40.0
	Adjusted Residual	.9	-.5	-.6	-1.5	-1.3	-.7	.3	

Table 4.11A Continued

TN County of Injury * Education Level Crosstabulation

		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
Dyer	Count	1	2	0	18	3	6	6	49
	Expected Count	1.3	3.5	.5	16.3	2.0	6.7	6.6	49.0
	Adjusted Residual	-.3	-.8	-.7	.5	.7	-.3	-.2	
Fayette	Count	0	0	0	6	0	0	1	10
	Expected Count	.3	.7	.1	3.3	.4	1.4	1.3	10.0
	Adjusted Residual	-.5	-.9	-.3	1.8	-.7	-1.3	-.3	
Fentress	Count	0	0	0	4	1	1	3	9
	Expected Count	.2	.6	.1	3.0	.4	1.2	1.2	9.0
	Adjusted Residual	-.5	-.8	-.3	.7	1.0	-.2	1.8	
Franklin	Count	1	3	0	14	1	5	5	43
	Expected Count	1.2	3.1	.4	14.3	1.8	5.9	5.8	43.0
	Adjusted Residual	-.2	-.1	-.7	-.1	-.6	-.4	-.3	
Gibson	Count	1	4	0	32	4	10	7	69
	Expected Count	1.9	5.0	.7	23.0	2.9	9.4	9.2	69.0
	Adjusted Residual	-.7	-.4	-.8	2.3	.7	.2	-.8	
Giles	Count	0	1	0	8	1	4	4	28
	Expected Count	.8	2.0	.3	9.3	1.2	3.8	3.8	28.0
	Adjusted Residual	-.9	-.7	-.5	-.5	-.2	.1	.1	
Grainger	Count	0	0	1	5	1	2	1	11
	Expected Count	.3	.8	.1	3.7	.5	1.5	1.5	11.0
	Adjusted Residual	-.6	-.9	2.7	.9	.8	.4	-.4	

Table 4.11A Continued

TN County of Injury * Education Level Crosstabulation

		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
Greene	Count	0	11	0	29	5	5	9	71
	Expected Count	1.9	5.1	.7	23.7	3.0	9.7	9.5	71.0
	Adjusted Residual	-1.4	2.7	-.9	1.3	1.2	-1.6	-.2	
Grundy	Count	0	1	0	2	1	0	0	7
	Expected Count	.2	.5	.1	2.3	.3	1.0	.9	7.0
	Adjusted Residual	-.4	.7	-.3	-.3	1.3	-1.1	-1.0	
Hamblen	Count	1	6	0	27	5	6	13	70
	Expected Count	1.9	5.0	.7	23.3	2.9	9.5	9.4	70.0
	Adjusted Residual	-.7	.5	-.9	.9	1.3	-1.2	1.3	
Hamilton	Count	5	22	0	115	12	66	65	405
	Expected Count	11.0	29.1	4.1	135.0	16.8	55.1	54.2	405.0
	Adjusted Residual	-1.9	-1.4	-2.1	-2.2	-1.2	1.6	1.6	
Hancock	Count	0	0	0	0	0	1	1	2
	Expected Count	.1	.1	.0	.7	.1	.3	.3	2.0
	Adjusted Residual	-.2	-.4	-.1	-1.0	-.3	1.5	1.5	
Hardeman	Count	0	2	0	14	0	1	2	22
	Expected Count	.6	1.6	.2	7.3	.9	3.0	2.9	22.0
	Adjusted Residual	-.8	.3	-.5	3.0	-1.0	-1.2	-.6	
Hardin	Count	1	0	0	4	0	0	3	9
	Expected Count	.2	.6	.1	3.0	.4	1.2	1.2	9.0
	Adjusted Residual	1.5	-.8	-.3	.7	-.6	-1.2	1.8	

Table 4.11A Continued

TN County of Injury * Education Level Crosstabulation

		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
Hawkins	Count	1	7	1	28	5	11	5	66
	Expected Count	1.8	4.7	.7	22.0	2.7	9.0	8.8	66.0
	Adjusted Residual	-.6	1.1	.4	1.6	1.4	.7	-1.4	
Haywood	Count	2	1	0	11	1	0	3	21
	Expected Count	.6	1.5	.2	7.0	.9	2.9	2.8	21.0
	Adjusted Residual	1.9	-.4	-.5	1.9	.1	-1.8	.1	
Henderson	Count	0	1	1	7	0	1	2	15
	Expected Count	.4	1.1	.2	5.0	.6	2.0	2.0	15.0
	Adjusted Residual	-.6	-.1	2.2	1.1	-.8	-.8	.0	
Henry	Count	0	5	0	11	6	3	7	40
	Expected Count	1.1	2.9	.4	13.3	1.7	5.4	5.4	40.0
	Adjusted Residual	-1.1	1.3	-.6	-.8	3.4	-1.1	.8	
Hickman	Count	0	0	0	2	1	2	1	10
	Expected Count	.3	.7	.1	3.3	.4	1.4	1.3	10.0
	Adjusted Residual	-.5	-.9	-.3	-.9	.9	.6	-.3	
Houston	Count	0	0	0	2	0	1	1	6
	Expected Count	.2	.4	.1	2.0	.2	.8	.8	6.0
	Adjusted Residual	-.4	-.7	-.2	.0	-.5	.2	.2	
Humphreys	Count	0	0	0	6	0	2	1	12
	Expected Count	.3	.9	.1	4.0	.5	1.6	1.6	12.0
	Adjusted Residual	-.6	-1.0	-.4	1.2	-.7	.3	-.5	

Table 4.11A Continued

TN County of Injury * Education Level Crosstabulation

		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
Jackson	Count	1	0	0	1	0	0	1	5
	Expected Count	.1	.4	.1	1.7	.2	.7	.7	5.0
	Adjusted Residual	2.4	-.6	-.2	-.6	-.5	-.9	.4	
Jefferson	Count	2	1	0	8	3	2	4	29
	Expected Count	.8	2.1	.3	9.7	1.2	3.9	3.9	29.0
	Adjusted Residual	1.4	-.8	-.5	-.7	1.7	-1.1	.1	
Johnson	Count	1	0	0	3	2	0	1	7
	Expected Count	.2	.5	.1	2.3	.3	1.0	.9	7.0
	Adjusted Residual	1.9	-.7	-.3	.5	3.2	-1.1	.1	
Knox	Count	16	47	6	187	13	76	56	514
	Expected Count	14.0	36.9	5.2	171.4	21.4	70.0	68.8	514.0
	Adjusted Residual	.6	1.8	.4	1.5	-1.9	.8	-1.7	
Lake	Count	0	0	0	0	1	0	0	2
	Expected Count	.1	.1	.0	.7	.1	.3	.3	2.0
	Adjusted Residual	-.2	-.4	-.1	-1.0	3.2	-.6	-.6	
Lauderdale	Count	0	2	0	16	1	2	2	28
	Expected Count	.8	2.0	.3	9.3	1.2	3.8	3.8	28.0
	Adjusted Residual	-.9	.0	-.5	2.7	-.2	-1.0	-1.0	
Lawrence	Count	0	5	0	11	0	3	6	36
	Expected Count	1.0	2.6	.4	12.0	1.5	4.9	4.8	36.0
	Adjusted Residual	-1.0	1.6	-.6	-.4	-1.3	-.9	.6	

Table 4.11A Continued

TN County of Injury * Education Level Crosstabulation

		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
Lewis	Count	0	0	0	7	0	1	3	13
	Expected Count	.4	.9	.1	4.3	.5	1.8	1.7	13.0
	Adjusted Residual	-.6	-1.0	-.4	1.6	-.8	-.6	1.0	
Lincoln	Count	1	1	0	6	1	4	2	21
	Expected Count	.6	1.5	.2	7.0	.9	2.9	2.8	21.0
	Adjusted Residual	.6	-.4	-.5	-.5	.1	.7	-.5	
Loudon	Count	0	2	0	13	3	3	3	30
	Expected Count	.8	2.2	.3	10.0	1.2	4.1	4.0	30.0
	Adjusted Residual	-.9	-.1	-.6	1.2	1.6	-.6	-.5	
Macon	Count	1	1	0	7	2	2	0	19
	Expected Count	.5	1.4	.2	6.3	.8	2.6	2.5	19.0
	Adjusted Residual	.7	-.3	-.4	.3	1.4	-.4	-1.7	
Madison	Count	6	17	3	57	1	29	13	165
	Expected Count	4.5	11.8	1.7	55.0	6.9	22.5	22.1	165.0
	Adjusted Residual	.7	1.6	1.0	.3	-2.3	1.5	-2.1	
Marion	Count	0	3	1	7	2	4	4	25
	Expected Count	.7	1.8	.3	8.3	1.0	3.4	3.3	25.0
	Adjusted Residual	-.8	.9	1.5	-.6	1.0	.3	.4	
Marshall	Count	0	1	0	8	1	1	4	26
	Expected Count	.7	1.9	.3	8.7	1.1	3.5	3.5	26.0
	Adjusted Residual	-.9	-.7	-.5	-.3	-.1	-1.5	.3	

Table 4.11A Continued

TN County of Injury * Education Level Crosstabulation

		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
Morgan	Count	0	1	0	3	1	1	0	7
	Expected Count	.2	.5	.1	2.3	.3	1.0	.9	7.0
	Adjusted Residual	-.4	.7	-.3	.5	1.3	.1	-1.0	
Obion	Count	0	6	0	25	4	10	4	105
	Expected Count	2.9	7.5	1.1	35.0	4.4	14.3	14.1	105.0
	Adjusted Residual	-1.7	-.6	-1.0	-2.1	-.2	-1.2	-2.9	
Out-of-State	Count	2	26	2	110	11	42	47	319
	Expected Count	8.7	22.9	3.2	106.3	13.3	43.4	42.7	319.0
	Adjusted Residual	-2.4	.7	-.7	.4	-.7	-.2	.7	
Overton	Count	0	0	0	2	0	1	1	6
	Expected Count	.2	.4	.1	2.0	.2	.8	.8	6.0
	Adjusted Residual	-.4	-.7	-.2	.0	-.5	.2	.2	
Perry	Count	0	1	0	6	1	0	2	11
	Expected Count	.3	.8	.1	3.7	.5	1.5	1.5	11.0
	Adjusted Residual	-.6	.2	-.3	1.5	.8	-1.3	.5	
Pickett	Count	0	0	0	0	0	2	1	3
	Expected Count	.1	.2	.0	1.0	.1	.4	.4	3.0
	Adjusted Residual	-.3	-.5	-.2	-1.2	-.4	2.7	1.0	
Polk	Count	0	1	0	0	1	2	1	7
	Expected Count	.2	.5	.1	2.3	.3	1.0	.9	7.0
	Adjusted Residual	-.4	.7	-.3	-1.9	1.3	1.2	.1	

Table 4.11A Continued

TN County of Injury * Education Level Crosstabulation

		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
Putnam	Count	2	4	2	15	4	5	10	68
	Expected Count	1.8	4.9	.7	22.7	2.8	9.3	9.1	68.0
	Adjusted Residual	.1	-.4	1.6	-2.0	.7	-1.5	.3	
Rhea	Count	1	2	1	7	2	2	4	31
	Expected Count	.8	2.2	.3	10.3	1.3	4.2	4.2	31.0
	Adjusted Residual	.2	-.2	1.2	-1.3	.6	-1.2	-.1	
Roane	Count	2	6	0	33	1	8	7	70
	Expected Count	1.9	5.0	.7	23.3	2.9	9.5	9.4	70.0
	Adjusted Residual	.1	.5	-.9	2.5	-1.2	-.5	-.8	
Robertson	Count	0	3	0	15	2	5	4	43
	Expected Count	1.2	3.1	.4	14.3	1.8	5.9	5.8	43.0
	Adjusted Residual	-1.1	-.1	-.7	.2	.2	-.4	-.8	
Rutherford	Count	10	23	1	118	9	39	33	322
	Expected Count	8.8	23.1	3.3	107.4	13.4	43.8	43.1	322.0
	Adjusted Residual	.4	.0	-1.3	1.3	-1.3	-.8	-1.7	
Scott	Count	1	5	0	22	5	4	12	55
	Expected Count	1.5	3.9	.6	18.3	2.3	7.5	7.4	55.0
	Adjusted Residual	-.4	.6	-.8	1.1	1.8	-1.4	1.8	
Sequatchie	Count	1	3	0	3	0	2	1	10
	Expected Count	.3	.7	.1	3.3	.4	1.4	1.3	10.0
	Adjusted Residual	1.4	2.8	-.3	-.2	-.7	.6	-.3	

Table 4.11A Continued

TN County of Injury * Education Level Crosstabulation

		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
Sevier	Count	1	7	3	40	4	13	9	104
	Expected Count	2.8	7.5	1.1	34.7	4.3	14.2	13.9	104.0
	Adjusted Residual	-1.1	-.2	1.9	1.1	-.2	-.3	-1.4	
Shelby	Count	21	29	11	280	17	136	75	696
	Expected Count	18.9	49.9	7.1	232.0	28.9	94.8	93.2	696.0
	Adjusted Residual	.5	-3.3	1.6	4.1	-2.4	4.8	-2.1	
Smith	Count	0	2	1	4	2	1	1	13
	Expected Count	.4	.9	.1	4.3	.5	1.8	1.7	13.0
	Adjusted Residual	-.6	1.1	2.4	-.2	2.0	-.6	-.6	
Stewart	Count	0	3	0	5	0	2	2	17
	Expected Count	.5	1.2	.2	5.7	.7	2.3	2.3	17.0
	Adjusted Residual	-.7	1.7	-.4	-.3	-.9	-.2	-.2	
Sullivan	Count	6	16	3	62	12	32	36	191
	Expected Count	5.2	13.7	1.9	63.7	7.9	26.0	25.6	191.0
	Adjusted Residual	.4	.7	.8	-.3	1.5	1.3	2.2	
Sumner	Count	4	6	2	26	10	11	20	121
	Expected Count	3.3	8.7	1.2	40.3	5.0	16.5	16.2	121.0
	Adjusted Residual	.4	-1.0	.7	-2.8	2.3	-1.5	1.0	
Tipton	Count	0	2	0	8	1	1	2	21
	Expected Count	.6	1.5	.2	7.0	.9	2.9	2.8	21.0
	Adjusted Residual	-.8	.4	-.5	.5	.1	-1.2	-.5	

Table 4.11A Continued

TN County of Injury * Education Level Crosstabulation

		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
Trousdale	Count	0	0	0	0	0	1	0	2
	Expected Count	.1	.1	.0	.7	.1	.3	.3	2.0
	Adjusted Residual	-.2	-.4	-.1	-1.0	-.3	1.5	-.6	
Unicoi	Count	1	1	0	7	0	2	2	17
	Expected Count	.5	1.2	.2	5.7	.7	2.3	2.3	17.0
	Adjusted Residual	.8	-.2	-.4	.7	-.9	-.2	-.2	
Union	Count	0	1	0	4	1	1	3	11
	Expected Count	.3	.8	.1	3.7	.5	1.5	1.5	11.0
	Adjusted Residual	-.6	.2	-.3	.2	.8	-.4	1.4	
Warren	Count	0	3	0	9	0	7	5	42
	Expected Count	1.1	3.0	.4	14.0	1.7	5.7	5.6	42.0
	Adjusted Residual	-1.1	.0	-.7	-1.6	-1.4	.6	-.3	
Washington	Count	6	10	2	60	8	23	25	156
	Expected Count	4.2	11.2	1.6	52.0	6.5	21.2	20.9	156.0
	Adjusted Residual	.9	-.4	.3	1.4	.6	.4	1.0	
Wayne	Count	1	0	0	2	3	3	2	13
	Expected Count	.4	.9	.1	4.3	.5	1.8	1.7	13.0
	Adjusted Residual	1.1	-1.0	-.4	-1.4	3.4	1.0	.2	
Weakley	Count	0	2	0	14	1	2	8	35
	Expected Count	1.0	2.5	.4	11.7	1.5	4.8	4.7	35.0
	Adjusted Residual	-1.0	-.3	-.6	.8	-.4	-1.4	1.6	

Table 4.11A Continued

TN County of Injury * Education Level Crosstabulation

			Education Level							Total
			BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
	White	Count	0	1	0	6	2	1	2	13
		Expected Count	.4	.9	.1	4.3	.5	1.8	1.7	13.0
		Adjusted Residual	-.6	.1	-.4	1.0	2.0	-.6	.2	
	Williamson	Count	4	5	4	19	3	10	15	86
		Expected Count	2.3	6.2	.9	28.7	3.6	11.7	11.5	86.0
		Adjusted Residual	1.1	-.5	3.4	-2.2	-.3	-.5	1.1	
	Wilson	Count	0	9	2	27	4	9	14	88
		Expected Count	2.4	6.3	.9	29.3	3.7	12.0	11.8	88.0
		Adjusted Residual	-1.6	1.1	1.2	-.5	.2	-.9	.7	
Total		Count	174	459	65	2133	266	871	857	6398
		Expected Count	174.0	459.0	65.0	2133.0	266.0	871.0	857.0	6398.0

Table 4.12A

Crosstabulation of the Variables District and Education Level

District * Education Level Crosstabulation

District		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
1	Count	8	13	2	83	12	27	33	204
	Expected Count	5.7	14.5	2.1	67.9	8.6	27.9	27.2	204.0
	Adjusted Residual	1.0	-.4	-.1	2.3	1.2	-.2	1.2	
2	Count	6	16	3	62	12	32	36	191
	Expected Count	5.4	13.6	2.0	63.6	8.0	26.1	25.5	191.0
	Adjusted Residual	.3	.7	.7	-.2	1.5	1.3	2.3	
3	Count	2	24	1	84	15	23	28	209
	Expected Count	5.9	14.9	2.2	69.5	8.8	28.5	27.9	209.0
	Adjusted Residual	-1.7	2.5	-.8	2.2	2.2	-1.1	.0	
4	Count	3	8	4	67	15	25	25	189
	Expected Count	5.3	13.4	2.0	62.9	7.9	25.8	25.2	189.0
	Adjusted Residual	-1.0	-1.6	1.5	.6	2.6	-.2	.0	
5	Count	5	11	0	29	3	8	15	94
	Expected Count	2.6	6.7	1.0	31.3	3.9	12.8	12.5	94.0
	Adjusted Residual	1.5	1.7	-1.0	-.5	-.5	-1.5	.8	

Table 4.12A Continued

District * Education Level Crosstabulation

District		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
6	Count	16	47	6	186	13	76	56	513
	Expected Count	14.4	36.5	5.3	170.7	21.5	70.1	68.4	513.0
	Adjusted Residual	.4	1.9	.3	1.5	-2.0	.8	-1.7	
7	Count	7	15	4	67	0	27	17	154
	Expected Count	4.3	11.0	1.6	51.2	6.5	21.0	20.5	154.0
	Adjusted Residual	1.3	1.3	1.9	2.7	-2.6	1.4	-.8	
8	Count	3	12	2	57	13	16	32	158
	Expected Count	4.5	11.2	1.6	52.6	6.6	21.6	21.1	158.0
	Adjusted Residual	-.7	.2	.3	.8	2.6	-1.3	2.6	
9	Count	2	10	0	50	5	12	12	112
	Expected Count	3.2	8.0	1.2	37.3	4.7	15.3	14.9	112.0
	Adjusted Residual	-.7	.8	-1.1	2.6	.1	-.9	-.8	
10	Count	3	16	2	42	17	29	36	196
	Expected Count	5.5	13.9	2.0	65.2	8.2	26.8	26.1	196.0
	Adjusted Residual	-1.1	.6	.0	-3.6	3.2	.5	2.1	
11	Count	5	21	0	114	12	66	65	403
	Expected Count	11.4	28.7	4.2	134.1	16.9	55.0	53.7	403.0
	Adjusted Residual	-2.0	-1.5	-2.1	-2.2	-1.3	1.6	1.7	

Table 4.12A Continued

District * Education Level Crosstabulation

District		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
12	Count	2	12	2	33	6	13	14	119
	Expected Count	3.4	8.5	1.2	39.6	5.0	16.2	15.9	119.0
	Adjusted Residual	-.8	1.3	.7	-1.3	.5	-.9	-.5	
13	Count	6	11	2	34	13	16	28	153
	Expected Count	4.3	10.9	1.6	50.9	6.4	20.9	20.4	153.0
	Adjusted Residual	.8	.0	.3	-2.9	2.7	-1.2	1.8	
14	Count	0	10	0	22	5	10	9	81
	Expected Count	2.3	5.8	.8	27.0	3.4	11.1	10.8	81.0
	Adjusted Residual	-1.5	1.8	-.9	-1.2	.9	-.3	-.6	
15	Count	2	12	3	39	8	13	16	127
	Expected Count	3.6	9.0	1.3	42.3	5.3	17.3	16.9	127.0
	Adjusted Residual	-.9	1.0	1.5	-.6	1.2	-1.1	-.2	
16	Count	10	23	1	120	9	41	34	328
	Expected Count	9.2	23.3	3.4	109.1	13.8	44.8	43.7	328.0
	Adjusted Residual	.3	-.1	-1.3	1.3	-1.4	-.6	-1.6	
17	Count	2	3	0	25	3	6	16	82
	Expected Count	2.3	5.8	.9	27.3	3.4	11.2	10.9	82.0
	Adjusted Residual	-.2	-1.2	-.9	-.5	-.2	-1.7	1.7	

Table 4.12A Continued

District * Education Level Crosstabulation

District		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
18	Count	4	6	2	26	10	11	19	120
	Expected Count	3.4	8.5	1.2	39.9	5.0	16.4	16.0	120.0
	Adjusted Residual	.3	-.9	.7	-2.7	2.3	-1.4	.8	
19	Count	4	8	2	47	3	19	10	132
	Expected Count	3.7	9.4	1.4	43.9	5.5	18.0	17.6	132.0
	Adjusted Residual	.1	-.5	.5	.6	-1.1	.2	-2.0	
20	Count	33	47	7	179	19	87	78	655
	Expected Count	18.4	46.6	6.8	217.9	27.5	89.4	87.3	655.0
	Adjusted Residual	3.6	.1	.1	-3.4	-1.8	-.3	-1.1	
21	Count	4	6	4	34	5	13	21	119
	Expected Count	3.4	8.5	1.2	39.6	5.0	16.2	15.9	119.0
	Adjusted Residual	.4	-.9	2.5	-1.1	.0	-.9	1.4	
22	Count	6	11	1	46	11	25	30	184
	Expected Count	5.2	13.1	1.9	61.2	7.7	25.1	24.5	184.0
	Adjusted Residual	.4	-.6	-.7	-2.4	1.2	.0	1.2	
23	Count	3	6	0	27	2	10	17	105
	Expected Count	3.0	7.5	1.1	34.9	4.4	14.3	14.0	105.0
	Adjusted Residual	.0	-.6	-1.1	-1.7	-1.2	-1.2	.9	

Table 4.12A Continued

District * Education Level Crosstabulation

District		Education Level							Total
		BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
24	Count	2	9	0	32	8	11	23	109
	Expected Count	3.1	7.8	1.1	36.3	4.6	14.9	14.5	109.0
	Adjusted Residual	-.6	.5	-1.1	-.9	1.6	-1.1	2.4	
25	Count	1	8	0	52	4	7	11	110
	Expected Count	3.1	7.8	1.1	36.6	4.6	15.0	14.7	110.0
	Adjusted Residual	-1.2	.1	-1.1	3.1	-.3	-2.2	-1.0	
26	Count	6	18	4	70	1	32	17	191
	Expected Count	5.4	13.6	2.0	63.6	8.0	26.1	25.5	191.0
	Adjusted Residual	.3	1.3	1.5	1.0	-2.6	1.3	-1.8	
27	Count	0	8	0	39	5	12	12	140
	Expected Count	3.9	10.0	1.5	46.6	5.9	19.1	18.7	140.0
	Adjusted Residual	-2.0	-.7	-1.2	-1.4	-.4	-1.8	-1.7	
28	Count	4	7	0	47	5	13	13	104
	Expected Count	2.9	7.4	1.1	34.6	4.4	14.2	13.9	104.0
	Adjusted Residual	.6	-.2	-1.1	2.6	.3	-.3	-.2	
29	Count	1	2	0	18	4	6	6	51
	Expected Count	1.4	3.6	.5	17.0	2.1	7.0	6.8	51.0
	Adjusted Residual	-.4	-.9	-.7	.3	1.3	-.4	-.3	

Table 4.12A Continued

District * Education Level Crosstabulation

District			Education Level							Total
			BS/BA	GED	Graduate Degree	High School Diploma	Less Than 9th Grade	Some College	Some High School	
	30	Count	21	29	11	280	17	136	75	696
		Expected Count	19.6	49.5	7.2	231.6	29.2	95.0	92.7	696.0
		Adjusted Residual	.3	-3.2	1.5	4.1	-2.5	4.8	-2.1	
	31	Count	0	3	0	9	0	7	5	42
		Expected Count	1.2	3.0	.4	14.0	1.8	5.7	5.6	42.0
		Adjusted Residual	-1.1	.0	-.7	-1.6	-1.4	.6	-.3	
Total		Count	171	432	63	2020	255	829	809	6071
		Expected Count	171.0	432.0	63.0	2020.0	255.0	829.0	809.0	6071.0

THE UNIVERSITY of TENNESSEE
Health and Safety Programs
College of Education, Health and Human Sciences
1914 Andy Holt Avenue
Knoxville, TN 37996-2710
Phone: (865) 974-5041
Fax: (865) 974-6439

December 6, 2004

HSP IRB#003

TITLE: An Assessment of the Relationship of the Permanent Partial Disability Multiplier for Low Back Injuries to the Final Resolution Mechanism Used to Reach a Permanent Partial Disability Award in Tennessee

Eric A. Fenstemaker
2000 Wilson Road, #100
Knoxville, TN 37912

Faculty Advisor: Dr. Susan M. Smith
374 HPER
Health and Safety Programs

Your research project listed above was reviewed by a committee and approved as EXEMPT research.

The approval is for a period ending one year from the date of this letter. A submission of renewal or prompt notification of project termination is needed in a timely manner.

Your responsibilities as principal investigator during data collection for this project include the following:

1. To obtain prior approval from the Program Review Chair before instituting any changes in the project.
2. To maintain records in a manner that protects the privacy of those participating in the project.
3. To submit a Form D to report changes to the project or to report termination at 12-month or less intervals.

The committee wishes you success in your research endeavors.

Sincerely,

Charles Hamilton

Charles Hamilton, DrPH
Health and Safety Program Review Committee

c: Brenda Lawson, UT IRB Office
Dr. Susan M. Smith

/ml

SD1

Revised 12-01

WORKERS' COMPENSATION STATISTICAL DATA FORM

Fraud Warning. It is a crime to knowingly provide false, incomplete or misleading information to any party to a workers' compensation transaction for the purpose of committing fraud. Penalties include imprisonment, fines and denial of insurance benefits.

This area for Department use only.	THIS FORM MUST BE FILED WITH THE CLERK OF THE COURT CONTEMPORANEOUSLY WITH THE FINAL ORDER IN ALL WORKERS' COMPENSATION CASES IN WHICH THE COURT EITHER TRIES THE CASE OR APPROVES A SETTLEMENT. FOR SETTLEMENTS SUBMITTED TO THE DEPARTMENT OF LABOR & WORKFORCE DEVELOPMENT FOR APPROVAL, SUBMIT THIS FORM WITH THE APPROVAL REQUEST. **NEITHER THE ORDER OF THE COURT NOR THE DEPARTMENT'S APPROVAL IS FINAL UNTIL THIS FORM IS FULLY COMPLETED AND FILED WITH THE APPROPRIATE ENTITY.** [STATUTORY AUTHORITY: TCA 50-6-244(b), (d)]	This area for Court use only.

I. EMPLOYEE INFORMATION

1. STATE FILE #	2. SOCIAL SECURITY NO:	3. DATE OF INJURY:
4. FIRST NAME:	5. MIDDLE INITIAL:	6. LAST NAME:
7. ADDRESS:	8. CITY:	9. STATE: / 10. ZIP:
11. COUNTY & STATE OF RESIDENCE AT TIME OF INJURY: COUNTY: STATE:	12. COUNTY & STATE OF RESIDENCE AT CONCLUSION OF CASE COUNTY: STATE:	
13. INSURER FILE #	14. DATE OF BIRTH:	15. DATE OF HIRE:

16. EDUCATION LEVEL: LESS THAN 9TH GRADE ☐ SOME HIGH SCHOOL ☐ GED ☐ HIGH SCHOOL DIPLOMA ☐ SOME COLLEGE/ASSOC DEGREE ☐ BS/BA ☐ GRADUATE/ PROFESSIONAL ☐

17. ABLE TO RETURN TO PRIOR EMPLOYMENTS? YES ☐ NO ☐ N/A ☐ REASONABLY TRANSFERRABLE JOB SKILLS? YES ☐ NO ☐ N/A ☐ READ & WRITE AT 8THGRADE LEVEL? YES ☐ NO ☐ N/A ☐

18. GENERAL WORK HISTORY (check all that apply) CLERICAL ☐ CONSTRUCTION ☐ FACTORY WORK ☐ MANAGERIAL ☐ MANUAL LABOR ☐ PROFESSIONAL ☐ RESTAURANT ☐ SALES, RETAIL, SERVICE ☐ TRANSPORTATION ☐

II. CLAIM/INJURY INFORMATION

19. INJURY OCCURRED: IN TN ☐ OUT OF STATE ☐	20. TN COUNTY OF INJURY:	21. AVERAGE WEEKLY WAGE:
22. WEEKLY COMP RATE:	23. SALARY PAID IN LIEU OF COMP? YES ☐ NO ☐	24. DATE OF FIRST TTD PAYMENT:

25. NATURE OF PRIMARY INJURY/ILLNESS: (AMPUTATION, CARPAL TUNNEL, HERNIA, HERNIATED/RUPTURED/SLIPPED DISC, LACERATION, PINCHED NERVE, SPRAIN, STRAIN, ETC)

26. BODY PART: (ARM, BACK, FOOT, HAND, LEG, NECK, WRIST, ETC)

27. WAS SURGERY PERFORMED? YES ☐ NO ☐	28. WAS PSYCHOLOGICAL INJURY CLAIMED? YES ☐ NO ☐	29. WAS PSYCHOLOGICAL INJURY SOLE CLAIM? YES ☐ NO ☐
30. DID EMPLOYEE RETURN TO WORK FOR SAME EMPLOYER? YES ☐ NO ☐ N/A ☐	31. RETURN TO WORK PAY WAS: LESS ☐, SAME ☐, HIGHER ☐, N/A ☐	
32. FIRST DATE OUT OF WORK:	33. FINAL RETURN TO WORK DATE:	34. TOTAL NUMBER OF DAYS LOST:
35. MMI DATE:	36. DATE RETURNED TO WORK BY PHYSICIAN:	37. IS EMPLOYEE CURRENTLY EMPLOYED? YES ☐ NO ☐ N/A ☐
38. IS EMPLOYEE CURRENTLY RECEIVING SOCIAL SECURITY DISABILITY? YES ☐ NO ☐ N/A ☐	39. IF "YES", DID SS DISABILITY RESULT FROM WORK INJURY? YES ☐ NO ☐ N/A ☐	
40. WAS CLAIM DENIED? YES ☐ NO ☐	41. IF "YES" TO 40, STATE BASIS OF DENIAL: STATUTE OF LIMITATIONS ☐, NOTICE ☐, NOT WORK RELATED ☐, INTOXICATED/POSITIVE DRUG TEST ☐, OTHER, SPECIFY,	

42. DID INJURY RESULT IN DEATH? YES ☐ NO ☐ IF YES, THEN LIST NAME, ADDRESS, DATE OF BIRTH, AND RELATIONSHIP OF ALL DEPENDENTS:

NAME:	ADDRESS:	DATE OF BIRTH:	RELATIONSHIP TO DECEASED:
NAME:	ADDRESS:	DATE OF BIRTH:	RELATIONSHIP TO DECEASED:
NAME:	ADDRESS:	DATE OF BIRTH:	RELATIONSHIP TO DECEASED:

STATE FILE #	SOCIAL SECURITY NO:	DATE OF INJURY:

III. EMPLOYER INFORMATION

43. EMPLOYER NAME: (not parent co., DBA where injured employee works)	44. FEIN:	45. COUNTY: (of employer location)	
46. ADDRESS:	47. CITY:	48. STATE:	49. ZIP:
50. DID EMPLOYER HAVE A CERTIFIED DRUGFREE WORKPLACE PROGRAM? YES ☐ NO ☐ N/A ☐		51. WAS EMPLOYER SELF INSURED? YES ☐ NO ☐ N/A ☐	
52. NAME OF INSURANCE CARRIER::		53. INSURANCE CARRIER FEIN:	
54. ADDRESS:	55. CITY:	56. STATE:	57. ZIP:
58. CLAIMS ADMINISTRATOR OR TPA FIRM NAME: (*If Different From Insurance Carrier*)		59. CLAIMS ADM/TPA FEIN:	
60. ADDRESS:	61. CITY:	62. STATE:	63. ZIP:
64. NAME OF CASE MGMT PROVIDER:		65. PROVIDER FEIN:	
66. ADDRESS:	67. CITY:	68. STATE:	69. ZIP:

IV. MEDICAL AND VOCATIONAL EXPERTS

NAMES OF TREATING PHYSICIANS					
70.	(A) LAST NAME:	(B) FIRST NAME	(C) MI:	(D) TITLE: MD ☐ DO ☐ DC ☐	(E) LICENSE NUMBER:
	(F) IMPAIRMENT RATING (%)	(G) TO BODY OR SPECIFIC MEMBER:		(H) SCHECULED MEMBER LOCATION LEFT ☐ RIGHT ☐ N/A ☐	
71.	(A) LAST NAME:	(B) FIRST NAME	(C) MI:	(D) TITLE: MD ☐ DO ☐ DC ☐	(E) LICENSE NUMBER:
	(F) IMPAIRMENT RATING (%)	(G) TO BODY OR SPECIFIC MEMBER:		(H) SCHECULED MEMBER LOCATION LEFT ☐ RIGHT ☐ N/A ☐	
72.	(A) LAST NAME:	(B) FIRST NAME	(C) MI:	(D) TITLE: MD ☐ DO ☐ DC ☐	(E) LICENSE NUMBER:
	(F) IMPAIRMENT RATING (%)	(G) TO BODY OR SPECIFIC MEMBER:		(H) SCHECULED MEMBER LOCATION LEFT ☐ RIGHT ☐ N/A ☐	
73.	(A) LAST NAME:	(B) FIRST NAME	(C) MI:	(D) TITLE: MD ☐ DO ☐ DC ☐	(E) LICENSE NUMBER:
	(F) IMPAIRMENT RATING (%)	(G) TO BODY OR SPECIFIC MEMBER:		(H) SCHECULED MEMBER LOCATION LEFT ☐ RIGHT ☐ N/A ☐	
EMPLOYEE'S IME(s)					
74.	(A) LAST NAME:	(B) FIRST NAME	(C) MI:	(D) TITLE: MD ☐ DO ☐ DC ☐	(E) LICENSE NUMBER:
	(F) IMPAIRMENT RATING (%)	(G) TO BODY OR SPECIFIC MEMBER:		(H) SCHECULED MEMBER LOCATION LEFT ☐ RIGHT ☐ N/A ☐	
75.	(A) LAST NAME:	(B) FIRST NAME	(C) MI:	(D) TITLE: MD ☐ DO ☐ DC ☐	(E) LICENSE NUMBER:
	(F) IMPAIRMENT RATING (%)	(G) TO BODY OR SPECIFIC MEMBER:		(H) SCHECULED MEMBER LOCATION LEFT ☐ RIGHT ☐ N/A ☐	
EMPLOYER'S IME(s)					
76.	(A) LAST NAME:	(B) FIRST NAME	(C) MI:	(D) TITLE: MD ☐ DO ☐ DC ☐	(E) LICENSE NUMBER:
	(F) IMPAIRMENT RATING (%)	(G) TO BODY OR SPECIFIC MEMBER:		(H) SCHECULED MEMBER LOCATION LEFT ☐ RIGHT ☐ N/A ☐	
77.	(A) LAST NAME:	(B) FIRST NAME	(C) MI:	(D) TITLE: MD ☐ DO ☐ DC ☐	(E) LICENSE NUMBER:
	(F) IMPAIRMENT RATING (%)	(G) TO BODY OR SPECIFIC MEMBER:		(H) SCHECULED MEMBER LOCATION LEFT ☐ RIGHT ☐ N/A ☐	
EMPLOYEE'S VOCATIONAL EXPERT					
78.	(A) LAST NAME:	(B) FIRST NAME	(C) MI:	(D) TITLE: PHD ☐ MA ☐ OTHER ☐	(E) VOCATIONAL DISABILITY RATING:
79.	(A) LAST NAME:	(B) FIRST NAME	(C) MI:	(D) TITLE: PHD ☐ MA ☐ OTHER ☐	(E) VOCATIONAL DISABILITY RATING:
EMPLOYER'S VOCATIONAL EXPERT					
80.	(A) LAST NAME:	(B) FIRST NAME	(C) MI:	(D) TITLE: PHD ☐ MA ☐ OTHER ☐	(E) VOCATIONAL DISABILITY RATING:
81.	(A) LAST NAME:	(B) FIRST NAME	(C) MI:	(D) TITLE: PHD ☐ MA ☐ OTHER ☐	(E) VOCATIONAL DISABILITY RATING:
CHIROPRACTIC/PHYSICAL THERAPY					
82. CHIROPRACTIC TREATMENT? YES ☐ NO ☐ N/A ☐ IF YES, NUMBER OF VISITS?				83. PHYSICIAL THERAPY? YES ☐ NO ☐ N/A ☐ IF YES, NUMBER OF VISITS?	

STATE FILE #	SOCIAL SECURITY NO:	DATE OF INJURY:

V. TYPE OF CONCLUSION AND COURT IDENTIFICATION INFORMATION

☐ TRIAL (Applicable only when the case has been TRIED by the court.)

☐ SETTLEMENT APPROVED BY COURT -COMPLAINT FILED (Applicable only when a lawsuit has been initiated by the filing of a complaint and summons.)

☐ COMPLAINT FILED – VOLUNTARY DISMISSAL TAKEN.

☐ SETTLEMENT APPROVED BY COURT - COMPLAINT NOT FILED. (Applicable only when a lawsuit has NOT been initiated by the filing of a complaint – term "joint petition" used to refer to this type of procedure for purposes of this form.)

☐ SETTLEMENT APPROVED BY DEPARTMENT OF LABOR & WORKFORCE DEVELOPMENT (Applicable only then the approval is by the Department.)

☐ COMPLAINT NEVER FILED ☐ COMPLAINT FILED AND DISMISSED

84. STYLE OF CASE:		85. COURT DOCKET NO:
86. COUNTY:	87. COURT:	88. FULL NAME OF TRIAL JUDGE/CHANCELLOR:
89. DATE COMPLAINT FILED:	90. DATE OF TRIAL:	91. DATE JOINT PETITION FILED:
92. DATE OF SETTLEMENT APPROVAL:	93. NAME OF APPROVING JUDGE/CHANCELLOR	
94. DATE OF SETTLEMENT APPROVAL BY SPECIALIST:	95. NAME OF SPECIALIST APPROVING SETTLEMENT:	

VI. BENEFIT REVIEW CONFERENCE

96. DATE OF CONFERENCE:	97. SETTLED? YES ☐ NO ☐ N/A ☐	98. NAME OF SPECIALIST:

VII. TRIAL RESULTS

99a. PPD%	TO BODY OR SPECIFIC MEMER:	LEFT ☐ RIGHT ☐; NUMBER OF WEEKS:
99b. PPD%	TO BODY OR SPECIFIC MEMER:	LEFT ☐ RIGHT ☐; NUMBER OF WEEKS:
100. PTD? . YES ☐ NO ☐ N/A ☐ IF YES, NUMBER OF WEEKS?		101. DEATH CLAIM? YES ☐ NO ☐ N/A ☐
102. JUDGMENT FOR EMPLOYER? YES ☐ NO ☐ N/A ☐, SELECT BASIS: STATUE OF LIMITATIONS ☐; NOTICE ☐; NOT WORK RELATED ☐; NO PERMANENCY ☐; INTOXICATION ☐; WILLFUL MISCONDUCT ☐; OTHER, SPECIFY		

VIII. SETTLEMENT TERMS

103a. PPD%	TO BODY OR SPECIFIC MEMER:	LEFT ☐ RIGHT ☐; NUMBER OF WEEKS:
103b. PPD%	TO BODY OR SPECIFIC MEMER:	LEFT ☐ RIGHT ☐; NUMBER OF WEEKS:
104. PTD? . YES ☐ NO ☐ N/A ☐ IF YES, NUMBER OF WEEKS?		105. DEATH CLAIM? YES ☐ NO ☐ N/A ☐
106. FUTURE MEDICAL EXPENSE: CLOSED ☐; OPEN FOR LIFE ☐; OR, OPEN FOR A SPECIFIED PERIOD? ☐		
107. WAS MONEY PAID TO CLOSE FUTURE MEDICALS? YES ☐ NO ☐ N/A ☐		108. DATE MEDICALS WERE OR WILL BE CLOSED:
109. IF BODY AS WHOLE, DID EMPLOYEE WAIVE RECONSIDERATION RIGHTS UNDER TCA 50-6-241(a)(2)? YES ☐ NO ☐ N/A ☐		110. WAS CASE SETTLED PURSUANT TO TCA 50-6-206(b)? YES ☐ NO ☐ N/A ☐

IX. SECOND INJURY FUND

111. WAS SECOND INJURY FUND A PARTY TO SUIT? YES ☐ NO ☐ N/A ☐		112. WAS JUDGMENT ENTERED AGAINST SECOND INJURY FUND? YES ☐ NO ☐ N/A ☐
113. APPORTIONMENT:	(1) EMPLOYER; ____ %; #WKS; _____ TOTAL AMT.	(2) SECOND INJ FUND ____ %; #WKS; _____ TOTAL AMT.

STATE FILE #	SOCIAL SECURITY NO:	DATE OF INJURY:

X. MONETARY AMOUNTS PAID

TYPE OF BENEFIT	PAID PRIOR TO TRIAL/ SETTLEMENT	PAID PURSUANT TO TRIAL RESULTS	PAID PURSUANT TO SETTLEMENT TERMS	TOTAL PAYMENTS
114. TEMP TOTAL DISABILITY				
115. TEMP PARTIAL DISABILITY				
116. PERMANENT PARTIAL DISABILITY				
117. PERMANENT TOTAL DISABILITY				
118. DEATH BENEFITS				
119. BURIAL EXPENSES				
120. MEDICAL EXPENSES TOTAL (includes medicine, PT, chiro, hospital, MD/DO costs, tests)				
121. CASE MANAGEMENT COSTS				
122. DISCRETIONARY COSTS				
123. AMOUNT PAID TO CLOSE FUTURE MEDICAL EXPENSE				
124. LUMP SUM PAYMENT (not based on specific disability %) DATE LUMP SUM PAID: _____				
125. TOTALS (ADD TOTALS FROM LINES 114 THRU 124)				
126. AMOUNT PAID IN LUMP SUM FROM LINES 114 THRU 119; _____ DATE LUMP SUM PAID _____ (DO NOT ADD THIS AMOUNT TO TOTAL PAYMENTS. IT IS ALREADY INCLUDED IN THE TOTALS ABOVE.)				

XI. ATTORNEYS FEES

127. EMPLOYEE'S ATTORNEY FEE; AMOUNT OF AWARD _____ % OF AWARD _____	128. WAS FEE APPROVED BY COURT ☐ OR TDLWD ☐
129. EMPLOYER'S ATTORNEY FEE (SPECIFY RANGE): UNDER $500 ☐ $501-999 ☐ $1000-1499 ☐ $1500-1999 ☐ $2000-2499 ☐ $2500-2999 ☐ $3000-3999 ☐ $4000-4999 ☐ $5000-5999 ☐ $6000-6999 ☐ $7000-7999 ☐ $8000-8999 ☐ $9000-9999 ☐ OVER $10,000 ☐	130. WAS FEE APPROVED BY COURT ☐ OR TDLWD ☐

XII. CERTIFICATION AND SIGNATURES

By providing my BPR number and my signature, I hereby certify that I have read the contents of the form and the information provided is true and correct to the best of my knowledge. ***ATTORNEY MUST PROVIDE BPR#.***

131. NAME OF EMPLOYEE'S ATTORNEY: BPR#	132. NAME OF EMPLOYER'S ATTORNEY: BPR#
133. NAME OF EMPLOYEE:	134. NAME OF ADJUSTER/CARRIER/EMPLOYER REPRESENTATIVE:

SIGNATURE OF EMPLOYEE DATE SIGNED

SIGNATURE OF ADJUSTER/CARRIER/EMPLOYER REP DATE SIGNED

SIGNATURE OF EMPLOYEE'S ATTORNEY DATE SIGNED

SIGNATURE OF EMPLOYER'S ATTORNEY DATE SIGNED

C20

TENNESSEE DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
EMPLOYER'S FIRST REPORT OF WORK INJURY OR ILLNESS

CLAIMS ADM/CARRIER

JURISDICTION CLAIM # (STATE FILE #)	CLAIM TYPE CODE ☐ MED ONLY ☐ INDEMNITY ☐ BECAME LOST TIME ☐ BECAME MED ONLY ☐ NOTIFY ONLY ☐ TRANSFER
CLAMS ADM CLAIM # (INSURER CLAIM #)	
OSHA LOG CASE #	
NAME OF INSURANCE CARRIER	CARRIER FEIN
CLAIMS ADMIN FIRM NAME (if different from carrier)	FEIN OF CLMS ADM
CLAIMS ADJUSTER NAME	CLMS ADJ PHONE #

The use of this form is required under the provisions of the Tennessee Workers' Compensation Law and must be completed and filed with your insurance carrier immediately after notice of injury.

It is a crime to knowingly provide false, incomplete or misleading information to any party to a workers' compensation transaction for the purpose of committing fraud. Penalties include imprisonment, fines and denial of insurance benefits.

If you have questions, the state now has a benefit review system where a Workers' Compensation Specialist can provide assistance. Call 1-800-332-2667 (TDD).

CLAIM HANDLING OFFICE ADDRESS LINE 1 AND LINE 2	CITY	STATE / ZIP

EMPLOYER

EMPLOYER NAME	EMPLOYER FEIN	SIC CODE	PHONE NUMBER
EMPLOYER ADDRESS LINE 1 AND LINE 2		NATURE OF BUSINESS	
CITY / STATE / ZIP		INSURED REPORT NUMBER	EMPLOYER LOCATION #

POLICY

INSURED NAME (parent co. if different than employer)	POLICY NUMBER	EFF DATE	EMPLOYMENT STATUS CODE ☐ FULL TIME/REGULAR ☐ PARTTIME ☐ PIECE WORKER ☐ SEASONAL ☐ VOLUNTEER ☐ APPRENTICE FULL TIME ☐ APPRENTICE PART TIME
	SELF INSURED? ☐ YES ☐ NO	EXP DATE	

EMPLOYEE

EMPLOYEE LAST NAME		PHONE INCL AREA CODE	GENDER ☐ MALE ☐ FEMALE ☐ UNKNOWN
FIRST / MI		DEPARTMENT REGULARLY WORKED	
ADRRESS LINE 1 & 2			OCCUPATION DESCRIPTION
CITY / STATE / ZIP			MARITAL STATUS ☐ UNMARRIED, SINGLE, DIVORCED ☐ MARRIED ☐ SEPARATED ☐ UNKNOWN
SSN	DATE OF BIRTH	DATE OF HIRE	NCCI CLASS CODE

WAGE

WAGE $	PERIOD ☐ HOURLY ☐ DAILY ☐ WEEKLY ☐ BI-WEEKLY ☐ MONTHLY	NUMBER OF DAYS WORKED PER WEEK	SALARY CONTINUED IN LIEU OF COMPENSATION ☐ YES ☐ NO FULL WAGES PAID FOR DATE OF INJURY ☐ YES ☐ NO

ACCIDENT/INJURY

DATE OF INJURY	TIME OF INJURY ☐ AM ☐ PM ☐ COULD NOT BE DETERMINED		TIME EMPLOYEE BEGAN WORK ON INJURY DATE ☐ AM ☐ PM
DATE EMPLOYER NOTIFIED OF INJURY	BODY PART AFFECTED CODE	NATURE OF INJURY CODE	CAUSE OF INJURY CODE
DATE CLAIM ADM NOTIFIED OF INJURY	How injury or illness occurred. Describe the incident including what the employee was doing just before, the part of the body affected and how, and object or substance that directly harmed the employee.		
DATE LAST DAY WORKED			
DATE DISABILITY BEGAN			
RETURN TO WORK DATE (IF APPLICABLE)			
DATE OF DEATH (IF APPLICABLE)	IF DEATH CLAIM, GIVE # DEPENDENTS FOR EACH RELATIONSHIP ☐ WIDOW ☐ WIDOWER ☐ MOTHER ☐ FATHER ____ DAUGHTER ____ SON ____ SISTER ____ BROTHER ____ HANDICAPPED CHILD		TOTAL # DEPENDENTS
DID INJURY/ILLNESS OCCUR ON EMPLOYER'S PREMISES? ☐ YES ☐ NO			
ADDRESS WHERE INJURY OCCURRED (if other than employer's premises) CITY / STATE / ZIP			COUNTY OF INJURY

TREATMENT

PHYSICIAN NAME		HOSPITAL OR OFF SITE TREATMENT NAME	
ADDRESS LINE 1 AND 2		ADDRESS LINE 1 AND 2	
CITY / STATE / ZIP		CITY / STATE / ZIP	
INITIAL TREATMENT ☐ NO MEDICAL TREATMENT	☐ MINOR BY EMPLOYER ☐ MINOR BY CLINIC/HOSPITAL	☐ HOSPITALIZED > 24 HRS ☐ EMERGENCY CARE	☐ FUTURE MAJOR MEDICAL/LOST TIME ANTICIPATED

OTHER

DATE PREPARED	PREPARER' NAME & TITLE	PREPARER'S COMPANY NAME	PHONE NUMBER

LB-0021 (REV 12-01)

C-23

TENNESSEE DEPARTMENT OF LABOR AND WORKFORCE DEVELOPMENT
Division of Workers' Compensation
Nashville, Tennessee 37243-0661

NOTICE OF DENIAL OF CLAIM FOR COMPENSATION

It is a crime to knowingly provide false, incomplete or misleading information to any party to a workers' compensation transaction for the purpose of committing fraud. Penalties include imprisonment, fines and denial of insurance benefits.

State File # _____

Claimant _____ Social Security # _____

Employer _____ FEIN # _____

Insurer _____ Insurer Claim# _____

Date of Injury _____ Date of Disability _____

1. Date compensation was denied: _____
2. Date claimant was notified of denial: _____
3. Date doctors were notified of denial: _____

State basis for denial of compensation: _____

_____

_____

_____

_____
Insurer/Self Insurer

_____
Address

_____
Address

Date _____

LB-0283 (rev. 8/99)

VITA

Eric Allan Fenstemaker was born in Canton, OH on July 21, 1959. He graduated from Canton McKinley Senior High in May of 1977 and began undergraduate studies at Kent State University the same year. In 1983 he moved to Louisville, KY and enrolled at the University of Louisville where he received a Bachelor of Science Degree in 1996. A Master of Occupational Health & Safety Management was earned from Indiana State University in December of 1999. With the encouragement of Dr. Portia Plummer (Indiana State University) he enrolled at The University of Tennessee, Knoxville in the spring of 2000 to pursue a PhD in Philosophy with a Major in Human Ecology and a Concentration in Community Health. His cognate area is Educational Leadership Lifelong Learning.

With twenty years of safety management experience he has taught undergraduate and master level courses on health & safety as well as transportation safety management. He has been a guest speaker at employer outreach programs and workers' compensation seminar's and presented various research projects at four National Safety Council Annual Congress & Expose. He was hired by the State of Tennessee Department of Labor and Workforce Development Workers' Compensation Division as a Workers' Compensation Specialist II in August 2003. In January of 2004 he was promoted to a Specialist III and in September of 2006 became the Program Coordinator of the Knoxville and is responsible for fourteen counties. He is a listed Rule 31 civil mediator through the Supreme Court of Tennessee.

While pursuing his degree, he married Janet Irene Klann of Rogers City, MI in May 2006. Together, they have won two national amateur crappie fishing tournaments

(Crappie USA) and the overall amateur point championship in 2006. It has been a life long dream of theirs to compete on the professional level and that goal will be realized in 2007.