Estimating the Impact of Occupational Fatal Injuries on the U.S. Gross Domestic Product

Elyce Anne Biddle

Dissertation submitted to the
College of Engineering and Mineral Resources
at West Virginia University
in partial fulfillment of the requirements
for the degree of

Doctor of Philosophy
in
Occupational Safety and Health

Daniel E. Della-Giustina, Ph.D., Chair
Rashpal S. Ahluwalia, Ph.D.
Daniel Hartley, Ed.D.
Michael J. Klishis, PhD.
Gary Winn, Ph.D.

Department of Industrial and Management Systems Engineering

Morgantown, WV

2004

Keywords: cost-of-injury, cost-of-illness, fatal occupational injury

ABSTRACT

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Elyce Anne Biddle

Mankind has been concerned with the safety and well-being of workers for more than 2,000 years. Despite this concern, occupational injuries have claimed the lives of nearly 60,000 American workers from 1992-2001 as reported through the Bureau of Labor Statistics Census of Fatal Occupational Injuries (CFOI) program. The traditional measures of the human loss used—frequency, rate, and severity—are not the only measures of the achievements of the occupational safety and health community. Nor are they the only means to direct efforts to reduce the number of occupational incidents. Economic loss is another perspective that provides a more complete and meaningful outcome evaluation over time, and can assist in directing scarce research resources. Estimates of the value of these lives have been calculated, but nearly all studies present an aggregate value, which sheds no light on the variations in costs for different case or worker characteristics.

This project developed a computerized model for calculating cost consequences, which provides a tool for policy makers to systematically examine current and potential research impacts, using standard economic measures. The model estimates comprehensive national costs for all occupational fatal injuries reported through CFOI and specific estimates for the burden on selected groups and characteristics of the fatality. These estimates can be incorporated into evaluative tools such as cost utility, cost effectiveness, cost benefit, and other decision analysis to assist in allocating limited resources more effectively. This study provides the means to determine the loss to U.S. income resulting from the contribution loss of the deceased workers—nearly $50 billion for 1992-2001 demonstrating the substantial loss of human capital that could be prevented. Unlike earlier works, this model uses a “bottom-up” approach by estimating the value of an individual fatality based on the key characteristics of that fatality, and then sums the individual fatality costs to arrive at the national burden in the aggregate and by individual characteristic. This model provides a new and reliable basis for targeting and evaluating the effectiveness of investments in the prevention of occupational fatalities for use by the occupational safety and health community—economic risk.

Acknowledgments

Without the help of those who supported and endorsed my efforts, this dissertation may never have been completed. My family and friends gave me moral support and encouragement throughout the years of my graduate studies. I am eternally indebted to my parents, Philip and Nettie Biddle, for teaching me that with hard work and determination I can accomplish the goals that I seek. I thank my sister, Marsha Biddle, for her constant supportive words and belief in my abilities. My son Teddy patiently endured my frustration; listened compassionately when I was discouraged with my progress, and constantly reminded me of my lesson to him—you must always finish a task that you begin.

Only with the patience of my co-workers at the National Institute for Occupational Safety and Health during my coursework and the development of the model, did I maintain sanity. I wish to extend special recognition to Dave Hilling for his assistance in developing the computer program.

I would like to extend sincere thanks to my committee Dr. Dan Della-Giustina, chair, for his guidance and understanding during the hours he devoted to helping me complete this dissertation. I would like to give special thanks to Dr. Hartley for not just assisting with this work, but for maintaining his friendship during those many stressful times. Dr. Winn helped me to find my way through this process by keeping me steadfast and through his calming manner keeping stress to a bearable level. Dr. Klishis was available whenever I sought help throughout my coursework and research. I would like to thank Dr. Ahluwalia for agreeing to join this committee at the final hour and providing a fresh view that made this a better product. I wish to thank them all for their wisdom, advice, assistance, and support.

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Chapter 1
Introduction

1.1 PROBLEM

Mankind has been concerned with the safety and well-being of workers for more than 2,000 years. Most of the earliest accounts focused predominately on health rather than safety issues. More specifically, there was a focus on the effects of mercury, lead, and other metals on mining workers. Hippocrates recognized the risk of lead poisoning among miners and recommended to his students that they consider environmental and work factors when making diagnoses. By the 1700's Bernardo Ramazzini published an exposition on occupational disease. He also suggested that physicians consider work factors, but expanded beyond mining into any work environment (Friend & Kohn, 2001).

With the advent of the industrial revolution, the interest on the relationship between injury and the work environment began to intensify. Mining remained one of the most dangerous industries—with 566 miners killed and 1,655 injured in one county in Pennsylvania over a seven year period (Petersen, 1989). Tragedy such as this began the movement toward improving the working conditions of the American worker. In 1869 Pennsylvania adopted a mine safety act that authorized mine inspections. In 1878, Caroll D. Wright conducted the first survey of working conditions. On the federal level, the right to regulate safety and health in firms engaged in interstate commerce was promulgated by the Interstate Commerce Act. A workers' compensation law was first passed in 1908, but only covered federal employees. By 1910-15, states were establishing departments charged with safety and industrial hygiene responsibilities including inspections of firms, and organizations focused on safety, such as the American Society of Safety Engineers and the National Council for Industrial Safety, emerged. The 1920's only saw additional emphasis on safety in the workplace, not only with 46 states legislating workers' compensation, but nearly 100 pamphlets describing safety practices were produced by the National Safety Council and nearly 200 safety standards were developed by the forerunner of the American National Standards Institute (Petersen, 1989).

The Walsh-Healey Act of 1936 provided protection of workers in a broad sense—no work could be performed if the establishment was unsanitary, hazardous, or was dangerous to the worker for federal contracts of over $10,000. These measures presented promise as the rate of incidents declined until the 1960's. Targeted efforts to thwart this new upward trend included the Fire Research and Safety Act in 1968 and the Construction Safety Act in 1969. 1969 also saw the passage of the Coal Mine Health and Safety Act establishing what would become the Mine Safety and Health Administration. However, it wasn't until the passage of the Occupational Safety and Health (OSH) Act (Public Law 91-596) in 1970 that a systematic national approach existed "to assure so far as possible every working man and woman in the Nation safe and healthful working conditions (29 U.S. Code [USC] 671)." The Act devised a three-pronged program to meet this mandate to improve safety and health in general industry and construction. The Department of Labor housed two of these prongs, the Occupational Safety and Health Administration (OSHA) and the Bureau of Labor Statistics (BLS). OSHA was created as the regulatory arm equipped to promulgate and enforce standards. The Bureau of Labor Statistics was deemed as the statistical arm to determine the number of occupational injuries and illnesses on a routine basis. Finally, the third prong, the National Institute for Occupational Safety and Health (NIOSH), now housed in the Department of Health and Human Services, was charged with conducting research to identify the causes of work-related injuries and diseases, to evaluate the hazards of work practices and new technologies, to develop ways to control these hazards, and to work in conjunction with OSHA by making recommendations for occupational safety and health standards.

Since the implementation of the OSH Act, these three agencies have helped the safety and health environment see marked improvement in the magnitude of the problem. Both fatal and nonfatal work-related injury rates have declined and illness research has nearly eliminated deadly diseases such as brown lung disease and liver cancer from vinyl chloride exposure. Although these improvements are laudable, workplace hazards continue to plague the American worker. According to BLS counts, each day an average of 9,000 workers sustain disabling injuries on the job and 16 die from such injuries. Work-related diseases take the lives of another 137 Americans daily (National Institute for Occupational Safety and Health [NIOSH], 2000). Each year, over 200 innocent bystanders of occupational incidents are killed and another 68,000 injured (Cullen, 2002).

However, measures of the human loss—frequency, rate, and severity—are not the only measures of the achievements of the OSH Act and the impact of the Act on the American public. Nor are they the only means to direct efforts to reduce the number of occupational incidents. Economic loss is another perspective that provides a more complete and meaningful outcome evaluation over time, and can assist in directing scarce research resources. According to one team of researchers, the problem translated into over $155 billion in direct and indirect costs, or 3% of Gross Domestic Product in 1994 (Leigh, et al., 2000). In this larger perspective, occupational injury and illness costs the American public more than AIDS, circulatory diseases, or cancer.

The responsibility of NIOSH, a public health agency, is to promote health and quality of life through prevention and control of disease, injury, and disability. The Division of Safety Research (DSR) within NIOSH narrows the focus to the study of occupational injury and fatality. Traditionally, DSR has defined risk in physical terms and focused on identifying the characteristics and magnitude of injuries and fatalities in the United States and mechanisms to prevent or ameliorate those injuries. Selecting research paths are determined by a number of methods or dictated by stakeholders. Employees, employers, other government agencies, labor organizations, and Congress have all requested specific research. However, DSR has only recently pursued research areas based directly on either the economic loss associated with the injury or fatality or by the economic improvements afforded by such research. This is, in large part, due to a lack of available specific cost data.

This lack of cost data has prohibited meaningful evaluation of the economic efficiency or equity that stems from work within DSR. Equity and efficiency considerations are key in policy evaluation. The extent that research measures the maximum amount of goods and services from the human and other resources in society must be measurable to defend the public resource expenditures. Similarly, it is crucial when allocating resources in a time of reduced federal dollars that changes in what group(s) of workers are able to consume what share of total production and in the equity of labor force participation is measured. Furthermore, Viscusi and Hamilton (1996) have asserted that government agencies commissioned to protect public health used much of their resources to reduce small risks at great expense while more appreciable and more easily moderated risks continue. They believe that society spends 90 percent of its resources to reduce the last 10 percent of risk. Without cost measurement of the effectiveness of the research conducted and the appropriateness of the balance of expenditures, the truth of this assumption can not be determined.

1.2 RESEARCH OBJECTIVES

The overarching goal of this study is to provide improved, reproducible, and defendable values of the dollar impact of traumatic occupational fatal injury for use by the occupational safety and health community, particularly public health agencies such as NIOSH. The cost by the attributes of the deceased worker and by characteristics surrounding the fatal incident should be derived in addition to the overall cost. These values can be used to demonstrate the impact on the Gross Domestic Product. Two objectives must be met to accomplish this goal.

The first objective is to determine the economic theory of cost measurement that best suits the needs of the public health organizations with the mission to improve the safety and health for all workers in the United States. Economic theory provides a number of alternative methods to calculate the cost of injury and fatality. However, no single method has been adopted in measuring the cost of occupational fatal injuries. This study will examine the more popular approaches adopted within the public health environment as well as approaches commonly adopted in other disciplines but not currently used within the health care field. These approaches can be collapsed into two major categories: cost-of-illness and willingness-to-pay. The cost-of-illness approach measures cost in terms of the value of lost output associated with reduced productivity of the fatally injured worker. The willingness-to-pay approach measures value by determining how much individuals are willing to pay for a safer and healthier work environment. More specifically for this study, it is the willingness-to-pay to save a life.

The second objective is to develop a program to calculate the lifetime cost to society of a single year (or multiple years), by characteristic of fatal occupational injury that can be aggregated to a total burden on society. Equally important is the ability to update this program as new years of fatality data become available. The program must be sufficiently easy to operate to allow for universal use throughout the occupational safety and health community. Furthermore, the results must be sufficiently transparent so that decision makers can employ the estimated values in support of their programs.

1.3 OVERVIEW

This project developed a standardized method for calculating cost consequences that can be coupled with cost analysis to enhance traditional occupational safety and health research. This project provides policy makers a tool to systematically examine current and potential programs using standard economic measures. It provides comprehensive national estimates for the economic burden of all occupational fatal injuries. The calculated costs from this research can be incorporated into evaluative tools such as cost utility, cost effectiveness, cost benefit, and decision analysis to assist in allocating limited resources more effectively. This model also provides an additional basis, economic risk, for targeting and evaluating the effectiveness of investments in prevention of occupational fatalities. Researchers within NIOSH are afforded a new tool capable of presenting economic costs as supporting the need for their individual research proposals.

This project is unique because it calculates costs based on individual characteristics and aggregates to a national cost thereby allowing for calculating costs by specific characteristics. It will provide national and state estimates for the economic burden of selected groups such as specific industries, occupation groups, minority workers, older workers, and teenage workers. The model was designed to allow for yearly updates, scenario analysis, and the potential for linking to other fatal or non-fatal databases.

This study is presented in five chapters; the first being the introduction which presents the problem studied, the objectives of the study and a brief overview of the organization of this dissertation. The following paragraphs briefly describe the remaining chapters.

A discussion of economic approaches to calculating the cost or value of non-market goods is contained in Chapter 2. This chapter discusses cost-of-illness and willingness-to-pay methods for deriving the value of premature fatalities. A review of the literature summarizing previous studies on the burden of an occupational injury or fatality is also found in this chapter.

The theoretical model and data sources used for calculations are presented in Chapter 3. The source for each model variable is named and described. The computer application used to run the model is also described in this chapter.

Results of the model calculations are captured in Chapter 4. Chapter 5 presents conclusions, discusses the limitations of the study, and presents potential future research.

Chapter 2

Theory and Literature Review

2.1 INTRODUCTION

> *…from the time of Hammurabi attempts have been made to establish the "value" of the lives of different classes of people, primarily for the purposes of punishment and restitution. A prince would be worth so many peasants in the harsh calculation of early justice, and no justification would be provided other than that of power and tradition. With the spread of markets, however, people came to think in terms of the calculus of wealth, and the idea dawned that prices could set the value not only of the things people own and use, but of life itself (Dorman, 1996, p. 51).*

Calculations of economic loss or burden can be based on a number of theoretical models. While various approaches have been discussed, no consensus has been reached among economists or policy analysts. Two approaches are dominant among the methods used to calculate the costs of injury, illness, or premature death: Cost-of-illness and willingness-to-pay. Both methods have strengths and weaknesses. The following sections briefly describe the theories underlying the approaches; present studies conducted using the methods, and finally describe the strengths and weaknesses of each.

2.2 WILLINGNESS-TO-PAY

2.2.1 Compensating Wage Differentials

Adam Smith's claim that workers in a competitive labor market would receive compensating wage differentials for all disagreeable aspects of their jobs, including the risk of injury or death, was accepted in economic theory as well as common law (Dorman, 1996). In 1852, John Stuart Mill in the third edition of *Principles of Political Economy* refuted Smith's position by asserting that if the supply of labor was so great that desirable workers have limited choices of available work, then the undesirable laborer must take whatever he can get. Thus, the hardships and earnings are now in an inverse relationship, just the opposite of any arrangement in a just society. (as cited in Dorman, 1996, p. 33).

An underlying assumption of the scenario described by Adam Smith is that workers in the labor market know and understand the risks associated with jobs and that they will work only the jobs that are within the limits of their risk tolerance. This implies that workers are willing to accept a certain level of job-related risk in return for a specific level of compensation. Additionally, a perfectly competitive labor market would require establishment of equilibrium prices for each job characteristic that is equal to its marginal cost (Folmer & van Ierland, 1989).

Most compensating-wage literature employs some form of hedonic wage equation to determine the relationship between wages and personal characteristics of the worker and the job. Worker characteristics such as wealth, age, sex, education, experience, union membership, and health are viewed as important because they affect the firm's demand for the individual worker, the worker's preferences, and other labor opportunities available to the worker (Kuchler & Golan, 1999). Individual worker preferences are partially determined by the labor market's demand for their particular skills. Job characteristics affecting safety levels include the fatality risk of the job, the nonfatal risk of the job, worker compensation benefits that are payable in case of injury on the job, and annuity benefits that are payable in the event of a fatal accident (Kuchler & Golan, 1999). The individual worker preferences and job-related characteristics combined with labor supply and demand create the wage premiums observed in the market.

The initial model assumes that all workers have identical skills and preferences, the unit cost of furnishing occupational safety is constant and exogenous, worker utility functions are well-behaved (exhibiting appropriate separability and diminishing marginal returns), all relevant information is available to all parties without cost, and nothing is lost by considering a given firm in isolation from the rest of the economy (partial equilibrium). The individual's utility function (*u)* begins as follows:

$$u=u(w,s) \qquad u_{w,}\, u_s>0 \tag{1}$$

where w is the compensation received and s is the safety level on the job. Labor market analysis requires that employers provide each worker with the same level of utility based on the "going rate"; therefore, $u = u_0$ for all workers. At the same time, firms seek to set employment and output levels to maximize profit. Given output levels, this is an optimal way to minimize labor costs subject to the utility constraint, $u = u_0$. Regardless of the number of workers an employer chooses to hire, each employer must solve the following constrained minimization equation

$$\min \mathrm{Z} = w + ks + \lambda(u_0 - u[w,s]) \tag{2}$$

where k is the constant unit cost of s per worker. Minimizing over w and s and rearranging the terms of the first-order conditions yields the characteristic result

$$\frac{u_w}{u_s} = \frac{1}{k} \tag{3}$$

The left side of this equation is the ratio of the marginal utility an employee would obtain from an increase in earnings to the marginal utility of an increase in safety. The right side of the equation is the cost of a unit increase in wages to the employer divided by the cost of supplying one unit increase in safety. The ratio of marginal costs equals the ratio of the marginal utilities. Furthermore, the first of these is the slope of a line for the tradeoff between wages and safety for a specified level of employer expenses. The latter is the slope of a worker's indifference (equal utility) curve u_0 where it clears the market. The solution is a tangency that is the slope of the indifference curve where it just touches the lowest iso-cost curve.

Early problems gaining access to micro-level data, which are required to accurately calculate compensating wage differentials, have hindered the acceptance of estimations generated using this approach. Ideally, subjective measures of risk would be reflected from the employee's and the employer's viewpoints for each job. The normal proxy is to use national data sets that provide information on several thousand workers and their occupations (Kuchler & Golan, 1999). Viscusi (1993) examined 24 labor-market studies and discovered that most of the estimates based on data for all injuries were between $25,000 and $50,000, with the severe type injuries requiring greater wage-risk trade-offs.

According to Viscusi (1993) and Fisher et al. (1989), the most successful applications of the compensating wage approach are empirical studies that include detailed worker and job characteristic variables, especially those that measure specific job-related risk (as opposed to occupational-related risk or general categories of risk). The labor-market studies reviewed by Fisher et al. (1989) estimate the range of the implicit value of life between $1.6 and $8.5 million (1986 dollars). Viscusi (1993), found the figures to be centered in the $3 to $7 million (1990 dollars) range. Viscusi views the estimates calculated from wage equations as more reliable than those calculated from structural models. A 1979 study by Viscusi produced an implicit value of life estimate of $4.1 million (1990 dollars). Furthermore, a 1988 study by Viscusi and Moore produced an implicit value of life estimate range of $2.5 - $7.3 million in 1990 dollars (Viscusi, 1992).

Critics of the compensating-wage approach argue that its assumptions concerning the labor market do not reflect characteristics of the actual labor market. The compensating wage method assumes that workers have complete information concerning the extent and consequences of on-the-job risks, that labor markets are strictly competitive, and that insurance markets are actuarially correct so that risks can be accurately assessed. (Kuchler & Golan, 1999). Additionally, this approach does not consistently account for confounding job characteristics, such as prestige of the firm or job title, alternative work schedules, and a workplace focused on insuring quality of work life that some workers may substitute for wages to compensate for risk (Kuchler & Golan, 1999). Furthermore, compensating-wage models consider all risks to be the same. It can be argued that not all fatality risks represent the same utility loss. For instance, a worker may view death by fire as much more painful than immediate death in a motor vehicle incident, thereby creating different values for those deaths. People are usually less willing to accept involuntary risk than risk that is voluntarily assumed through contract of employment. Consequently, compensating-wage studies probably underestimate society's aversion to risk that is not contracted for (Gunderson & Hyatt, 2001).

The most common criticism of compensating-wage approaches is that comparison of studies is almost impossible because of heterogeneity problems. This stems partly, from the large fluctuations in value of life estimates generated within the typical population, high-risk blue-collar males, used for compensating-wage studies. Therefore the application of the results of a compensating-wage study to the general population is inappropriate.

The most striking observation that emerges from the compensating wage literature is the sensitivity of value-of-life estimates to the characteristics of the study population and to the level and type of risk Viscusi, 2003). As a result, the general applicability of these estimates is questionable. "The value of life is not a universal constant, but reflects the wage-risk trade-off pertinent to the preferences of the workers in a particular sample" (Viscusi, 1993, p. 1930). Therefore, compensating wage studies indicate a range for implicit value-of-life measures but caution should be exercised in making general conclusions about the value of life.

2.2.2 Contingent Valuation

The contingent valuation method (CVM) asks respondents to state their willingness-to-pay (WTP) or willingness-to-accept (WTA) given a hypothetical situation describing how a change in morbidity will be accomplished as well as describing how payment for this change would be made. The value is measured in terms of a utility function through the use of WTP and WTA compensation in addition to measures of consumer's surplus. WTP measures estimate the compensating variation for welfare improvement and equivalent variation for decreases in welfare. The reverse is true for WTA--equivalent variation for welfare improvements and compensating variation for welfare decreases. This Hicksian measure is a dollar measure of preference that is equivalent to a change in income combined with a change in condition with no change in the respondent's utility level. The estimates are based on purely subjective choices made by the respondent--consistent with the concepts of economic utility.

These four welfare measurements can be derived through six individual steps. These steps are:

1) Setting up the hypothetical situation;
2) Obtaining bids;
3) Estimating mean willingness-to-pay and/or willingness-to-accept;
4) Estimating the bid curves;
5) Aggregating the data; and
6) Evaluating the activity.

In step one, a sample of individuals is given a detailed description of a hypothetical market for the amenity, in this case, good health. The respondent is also given the method of payment, such as income tax, property tax, or direct payment into a trust fund. What groups or members of society, if not all, will be responsible for paying this bill will also be outlined at this point. Bids can be obtained in a number of ways, but all ask the respondent to state their maximum WTP or minimum WTA to forego the improvement. Examples of these bid mechanisms include bidding game, closed-ended referendum, payment card, and open-ended question. After all bids are made, an average is calculated. Consideration is given to acceptance of outlying bids such as zero or extraordinarily high bids before continuing. The fourth step involves estimating the bid curve, which is usually accomplished through regressing the bids against independent variables, such as age, sex, education, and income. The next step allows for aggregating the mean bids to a population total value figure. Hanley and Spash (1995) suggest that three decisions are now relevant: identifying the population of interest, determining the mathematical method for aggregation--either simply by multiplying the mean by the population size or using weighted least squares, and selecting a time period for aggregation. Finally, the process and estimates should be evaluated for representativeness, accuracy, comparability with other studies, and possible biases.

CVM was originally proposed to estimate the benefit of a recreation area in Maine by R. Davis in his article “Recreation planning as an economic problem” published in the *Natural Resources Journal* in 1963. During the 1970's and 1980's this theoretical approach saw many empirical and theoretical refinements. During these years, studies fell mainly into two categories. The first measured the willingness-to-pay for health improvements, while the second measured reductions in the hazard itself under the assumption that respondents could measure their own dose-response functions. Studies measuring the WTP for health improvements included Jones-Lee (1976), Loehman et al. (1979), Loehman and De (1982), Berger,et al. (1987), and Rowe and Chestnut (1984). Brookshire et al. (1979) and Schulze et al. (1983) used the second method in their studies.

The number of CVM studies increased steadily throughout the 1980's and 1990's. However, they typically involved valuation of reducing less-severe symptoms and offer little comparability across studies because of differences in reporting and differences in the symptoms being evaluated (Kenkel et al., 1994). In a 1997 study by Diener et al. (1998), eight CVM studies with empirical results were reviewed. Nearly 90% of these studies conducted a cost-benefit analysis. Of these studies, 37 involved specific diseases--such as respiratory diseases, cardiovascular disease, or cystic fibrosis screening, or symptoms. None were studies dealing with the overall burden regardless of disease or dealing with injury rather than disease. However, in 1993 a Swiss pilot study by Christe (1995) was conducted to determine the human costs generated by road accidents. Loss of life, physical and mental suffering of the victim and mental suffering of the victim’s relatives were the human cost measured. The results indicated, among other difficulties, the need for extensive questionnaire redesign and an intermediate stage to allow a respondent to properly consider risk levels and risk reductions. The author concluded, “Whatever the improvements that could be made to the questionnaire, we must nevertheless realise that a number of problems will not be solvable.”

A dominant criticism of this methodology is that the demand for health or life in the extreme may not be accurate because the transactions are hypothetical in nature—not requiring the respondent to actually give up cash or any other tangible good. In addition, Mitchell and Carson (1989) report that systematic biases exist for three primary reasons. First, there is strategic or compliance biases because respondents have strong incentives to misrepresent their WTP. Second, there can be misperception of the scenario; finally, there is bias when the scenario offers implied value cues to assist the respondent in deciding on their WTP.

On a positive note, Viscusi (1993) argues that contingent value is a better measure because these studies estimate the respondent’s utility function. It can therefore avoid some of the estimation problems (specifically heterogeneity) found in other WTP methods by modeling a value-of-life as a function of income and non-marginal changes in risk. Furthermore, CVM studies are not limited by the ability to acquire market data.

2.3 COST-OF-ILLNESS

The Cost-of-illness (COI) method estimates the value of an occupational injury, illness, or fatality by summing the value of two components: direct and indirect costs. Direct costs consist of the actual dollar expenditures associated with the injury or illness and include the value of all goods, services, and other resources that are consumed. They are the value of those resources that could have been used elsewhere if the injury or illness had not occurred. The most prominent direct costs are health care costs, which include physician's visits, prescription medicines, physical therapy, ambulance service, and hospitalization fees. Other direct costs include insurance administration costs, vocational rehabilitation, attendant care, and nursing home expenditures. These costs can be incurred in the present time or at some point in the future.

Indirect costs in this model are measured using an aggregative statistical-based approach, the human-capital method. This method values health according to the economic productivity of the worker. Calculating the full economic or productivity loss requires determining the sum of the discounted value of all lost present and future productivity of the worker, both market and non-market. Market loss is the value of the decedents' lost future earnings. Non-market loss represents the present and future value of goods and services they would have produced in the home. While these values can be calculated net of consumption and taxes, the majority of recent studies are computed as gross estimates (Kuchler & Golan, 1999).

A variation of this method measures only the "frictional" portion of economic loss (Koopmanschap et al., 1995). In this method, only the time required for a replacement for the injured worker to be hired and trained to produce at the pre-injury level or the time for the worker to return to work and produce at the pre-injury level is considered as a productivity loss. This method is primarily useful in measuring loss from a corporate perspective.

The theoretical underpinnings of human capital have been explored by many researchers and expressed in slightly differing terms. According to Dorman (1996), this method draws from the economic theory that, in general competitive equilibrium, a worker's wage is equal to his marginal product. Therefore, the present value of lost future wages is an appropriate measure of the value of economic output lost due to premature death. It then follows that this is as logical a measure of the social cost of occupational fatalities as any. Similarly, Hodgson and Meiners (1982) state that the human capital methodology assumes that earnings reflect productivity–the value of each worker's contribution to output is measured by the marginal value of output from the last-hired worker. Therefore, it is a measure of resources lost and unavailable for other uses. Robinson (1986) traces the origins of the human capital approach to economic doctrine from the beginning of the 19th to the middle of the 20th centuries. Here, government policy should operate to increase the wealth of the nation, which the Department of Commerce measures as national income. Because of this link, this method has been referred to as "output accounting" approach (Institute of Medicine, 1981).

Early studies reported by Hu and Sandifer (1981) for the National Center for Health Services Research include the 1950 Malzberg study which has been considered the first formal COI study measuring the indirect costs of mental illness, a 1956 study by Reynolds on the cost of road accidents, and a 1958 study on the cost of mental illness by Fein. Studies in the 1960's included Mushkin's examination of health as an investment in 1962, Klarman's 1964 study on syphilis control, and finally the work by Rice in 1966, which detailed the framework and procedures used as the basis for many of the current studies. This method was also employed in regulatory and program analysis during the 1970's—1972 examples include the U.S. Office of Science and Technology examining the "Cumulative Regulatory Effects on the Costs of Automotive Transportation" and the U.S. Department of Transportation National Highway Safety Administration measuring the "Societal Costs of Motor Vehicle Accidents." Cooper and Rice (1976) prepared national estimates for the cost of all diseases, and Berk, Paringer & Mushkin (1978) exemplified studies that improved upon these methods during the 1970's. According to Hu and Sandifer, in the last 20 years, studies using the COI approach have topped 200. Unfortunately, many of these studies have been limited to selected diseases or populations. Comparability of these studies is further limited by the use of differing data sources and methods, as well as the extent to which they have captured all possible direct and indirect costs.

In 1987 Congress directed the National Highway Safety Administration (NHTSA) and the Centers for Disease Control and Prevention (CDC) trauma research program to jointly design a study to measure the impact of injury and disability on the United States. The study was conducted by the Institute for Health and Aging of the University of California and The Johns Hopkins University Injury Prevention Center. This research built upon the human capital theory developed by Becker (1975) and adopted the Rice methods of the 1960's. The work not only presented the aggregate and per capita lifetime costs of injury to society by cause of injury, but also made recommendations for strategies to reduce the impact of injury (Rice, et al. 1989).

More recently, a single investigator has conducted numerous studies measuring the burden of occupational injury on the U.S. society. Ted Miller has been responsible for many studies, books, and journal articles. (Miller, 1989; Miller, 1990; Rossman, Miller, & Douglass, 1991; Miller, et al., 1991; Miller, Cohen, & Rossman, 1993; Miller, Pindus & Douglass, 1993; Miller & Galbraith, 1995; Miller, Pindus, Douglass & Rossman, 1995; Miller, 1997; Miller, et al., 1998). The National Highway Traffic Safety Administration, the Consumer Product Safety Commission, NIOSH, Environmental Protection Agency, and the National Safety Council have used his methods, providing some consistency of cost estimation throughout federal agencies. His methods expand standard COI by including intangible costs estimated through willingness-to-pay methods. Miller's most recent work is sponsored by a NIOSH grant and on completion will calculate the cost of injury and illness based on the BLS annual survey of occupational injury and illness. Estimates will be generated for those incidents involving days away from work and will be presented by worker and case characteristic.

Perhaps the most quoted source on the COI approach is work done by Leigh, Markowitz, Fahs, Shin, and Landrigan completed in 1996. They were the first to concurrently evaluate the magnitude of the occupational injury and illness problem and the cost simultaneously from a societal perspective. However, total costs were derived first, and then individual estimates were derived for subsets of the aggregated totals. Building upon this work, the first comprehensive estimate of occupational injury and illness (Leigh, et al., 2000) was published. Leigh has continued his work by conducting several studies that focus on specialized groups of workers such as agricultural workers and workers in California (Leigh, et al., 2001, Leigh, et al. 2001).

While widely adopted in the safety and health research community, the COI method has critics. Many economists reject national income as a welfare measure and conclude that COI is an inadequate measure of the social cost of premature death (Kuchler & Golan, 1999). Furthermore, when the key assumptions of the marginal productivity theory--labor markets are competitive and firms behave to maximize profits-- are not met, the human capital approach is flawed. Values are generally higher for men than women, for whites than workers of color, and for middle-aged workers than for either older or younger workers (Rice, et al., 1989; Hodgson & Meiners, 1982; Dorman, 1996). Hodgson suggests that because of this phenomenon, the method measures not the value of life but rather the value of output as measured by earnings. Therefore, the relevant shortcomings are associated with imperfections in the labor market that create earnings that differ from the value of output. Well-documented examples include discrimination in hiring and earnings associated with age, race, sex, or ethnic background and the differences in pay levels between union and nonunion workers. For example, Kuchler and Golan (1999) conclude that COI estimates would indicate that a disease that strikes only males is more severe than a disease that strikes only females strictly because of the variation in earnings between the two populations based on a 1972 study by Cooper and Brody (1976). Services that are not reimbursed in the market, such as household production and volunteer workers, are also problematic. Further complications result because calculation of expected future incomes requires assumptions concerning promotion potential and occupational mobility, as well as changes in broader economic conditions that could also affect future earnings. Additionally, foregone earnings do not account for the value that individuals place on their own lives. Finally, COI does not account for psychosocial costs such as pain and suffering that is associated with occupational injury and illness.

2.4 MISCELLANEOUS CONSIDERATIONS

Besides the theoretical models named above, one additional attempt at deriving the most accurate measure of the value of a life was considered before a final selection was made. Landefeld and Seskin (1982) proposed a compromise of the two theories. First, the human capital approach was expanded to derive the present value of non-labor income losses such as interest from capital holdings. At the same time, the calculations excluded the value of non-market activities. Second, the present value of labor and non-labor income was adjusted by a risk-aversion factor. This factor represents an individual’s willingness-to-pay to avoid financial losses that are connected with risks to life. While some researchers have adopted this method under the assumption that it presents improved estimates (Roberts & Foegeding, 1991, Buzby & Roberts, 1995), many of the limitations associated with both theories are embodied in this combined method.

2.5 THEORY SELECTION

Strengths and weaknesses of each theoretical model that could be employed to measure the cost of occupational traumatic fatalities were examined. The cost-of-illness approach was selected as the best approach for use for the following four reasons. First, according to renowned researchers in the field, this method is considered to be the most appropriate for a public health agency to select (Rice, et al., 1989; Haddix, et al. 1996). In addition, it is the most frequently used method to determine judgments in wrongful deaths. Therefore, adopting this conceptual model will make these estimates relevant to current policies and practices of the tort system (King and Smith, 1988; Dorman, 1996). Secondly, adopting this method is the most pragmatic in that data are reliable, easily acquired, and most often free of charge (Rice, et al., 1989). Calculating national estimates using the willingness-to-pay approach is extremely labor intensive and requires expensive surveys as well as significant developmental work prior to implementation. Furthermore, the WTP estimates are subject to great variability based on the respondent's economic status and their physical and mental condition at the time of the survey. Thirdly, computations are easy to perform and easy to understand by those who are not economists. This is particularly meaningful for NIOSH because economists represent less than 1% of the staff. Finally, COI is a measure of the impact of a premature death on society (Kuchler & Golan, 1999) rather than the value of an individual's assessment of reducing the risk of fatal injury. For this study, the ex-post outcome or impact was the desired outcome.

Chapter 3
Methods

3.1 Model

The cost-of illness theoretical approach was employed for this study. The indirect lifetime cost of an occupational fatal injury is derived by calculating the present value of future earnings summed from the year of death until the decedent would have reached age 67, accounting for the probability of survival were it not for the premature death. The indirect costs are modeled as follows (Rice, 1965):

$$\mathrm{PVF}=\sum_{n=y}^{67} P_{y,s}(n)\,[Y_{s,j}(n)+Y_s^h(n)]*(1+g)^{n-y}/(1+r)^{n-y} \quad (4)$$

where:

PVF	= present discounted value of loss due to occupational fatal injury per person
$P_{y,s}(n)$	= probability that a person of race r, sex s, and age y will survive to age y+1
y	= age of the individual at death
s	= sex of the individual
n	= age if the individual had survived
$Y_{s,j}(n)$	= median annual earnings of an employed person of sex s, occupation j, and age n (includes benefits and life-cycle wage growth adjustment)
$Y_s^h(n)$	= mean annual imputed value of home production of a person of sex s and age n
g	= wage growth rate attributable to overall productivity
r	= real discount rate (3%)

Combining these indirect costs with direct costs yield the overall lifetime cost of an occupational fatal injury. For this study, medical expenses were used to estimate the direct cost associated with the fatality.

The model presented here calculates incidence-based costs, the lifetime cost of all injuries occurring in a given year regardless of what year the costs are accrued, rather than prevalence-based costs. The incidence basis was selected as it best measures possible savings from prevention efforts to avoid additional fatalities and future economic evaluation studies (Dickie & Gerking, 1991; Koopmanschap, (1998), and in recent years has been widely adopted (Miller, et al., 1995; Rice, et al., 1989; Leigh, et al, 2000). Because this model addresses only fatalities, the significant problem of estimating the varying medical costs over time associated with a prevalence basis identified by Miller, et al. (1995) was eliminated. Nearly nine of ten of the fatalities captured in the CFOI system occurred within one day of the injury event; therefore, medical expenses were included in the first year calculations only.

The model builds on a model first developed by Dorothy Rice in 1965. This first model was limited by available data sources. However, because this new model calculates the cost of known fatalities, several assumptions were made to modify the Rice model. First, because the decedents were known to be employed at the time of death, the participation rate in the labor force was eliminated. Furthermore, the accuracy of annual earnings was improved by using median wage data based on the occupation of the decedent. Because the retirement age of workers has increased over time, calculations were ceased after age 67; however, one iteration of the indirect cost calculation was performed to account for the associated loss of productivity for victims older than 67 at the time of death. Finally, the model employed constant dollars to allow for aggregation across differing years of death.

Two assumptions concerning wage growth were made for this model. Deaths were assumed to be uniformly distributed by month and as a result, the wage growth rate was reduced by one-half in the first year. Second, because the model forecasts the decedent's wages for up to 50 years into the future, a long-term economic growth rate was employed.

3.2 Data Sources

3.2.1 Fatality Number and Characteristics

Data for traumatic occupational injury deaths used in this analysis were taken from the Bureau of Labor Statistics (BLS) Census of Fatal Occupational Injuries (CFOI). The National Academy of Science Panel on Occupational Safety and Health Statistics recommended that BLS "work with State agencies to carry out studies in which complete rosters of occupational fatalities are compiled from death certificates, medical examiner records, workers' compensation claims and reports to OSHA...." (Pollack and Keimig, 1987, p. 106). BLS responded to this charge by developing and implementing the on-going collection efforts found in CFOI. The most pronounced change from any existing system was the use of more than one source to determine if a fatality were work-related. In 1991, data from 32 States were collected and published using a multiple-source document model. By 1992, CFOI was operational in all 50 States and the District of Columbia and was collected for all military, civilian, and self-employed workers regardless of age. A comparison of this program to the earlier collection system maintained by the National Institute for Occupational Safety and Health can be found in Biddle and Marsh, 2002.

State program participants gather information from workers' compensation records, death certificates, news reports, and reports from administrative agencies. They also collect data, perform necessary follow-up activities, and code data elements. BLS provides source documents to the States and the District of Columbia from other federal agencies such as the Occupational Safety and Health Administration, National Transportation Safety Board, U.S. Coast Guard, and the Mine Safety and Health Administration. BLS reviews information for each fatality, prepares an annual national database for analysis, and disseminates information.

This system defines a traumatic injury as "any unintentional or intentional wound or damage to the body resulting from acute exposure to thermal, mechanical, electrical, chemical, or other form of energy or from the absence of such essentials as heat or oxygen caused by a specific event, incident, or series of events within a single workday or shift" (Bureau of Labor Statistics, 1994, p. 8). Examples include intracranial and internal injuries, suicides, homicides, asphyxiations, and open wounds.

In CFOI, a fatality is work-related if the decedent is "working for pay, compensation, or profit or in the family business at the time of the event and engaged in a legal work activity or present at the site of the incident as a requirement of his or her job" (Bureau of Labor Statistics, 1994, p. 4). Work is defined as "duties, activities, or tasks that produce a product or result; that are done in exchange for money, goods, services, profit, or benefit; and that are legal activities in the United States" (Bureau of Labor Statistics, 1994, p. 8).

As mentioned earlier, this program uses a multiple source model. The system requires that work relationship be substantiated by two or more independent source documents or a source document and a follow-up questionnaire. Consensus must be reached between State and BLS personnel that sufficient information is available to deem the injury as work-related if substantiation cannot be made due to extenuating circumstances. Telephone inquiries are used to follow-up on nonresponse or inconsistent data.

Thirty variables are coded in the CFOI file including worker characteristics such as occupation and type of employment (military, civilian, and self-employed), sex, and age; and case characteristics such as the fatal event or exposure, the source of injury, and worker activity at the time of the incident. The BLS-developed Occupational Injury and Illness Classification Structure adopted by the American National Standards Institute (ANSI) Z16.2-1995 standard (American National Standards Institute, 1996) was selected to categorize the characteristics. This structure is used to classify five basic facts associated with an injury and the circumstances surrounding that injury (Nature of Injury or Illness, Part of Body Affected, Source of Injury or Illness, Event or Exposure, and Secondary Source of Injury or Illness). Occupation at the time of injury was coded to the 1990 Bureau of the Census occupation scheme (Bureau of the Census, 1990). Industry at the time of injury was classified using the 1987 Standard Industrial Classification (SIC) structure (Executive Office of the Presidency, 1987).

Private sector fatality data for the years 1992-2001 from CFOI were employed for this study. Worker and case characteristics selected from this census included: age, sex, occupation, and race of the worker; employer industry, state of injury, Nature of Injury or Illness, Part of Body Affected, Source of Injury or Illness, Event or Exposure, activity of the decedent at time of death, location of decedent at time of death, and year of death.

3.2.2 Probability of Survival

Productivity losses were adjusted by the probability that the individual would have remained in the labor market were it not for the premature death that resulted from an occupational event or exposure. The probability estimates used in this study were developed by the National Center for Health Statistics, Division of Vital Statistics. This agency used data from the 1990 Census of Populations and deaths occurring in the United States to U.S. residents for 3 years, 1989-91 (U.S. Department of Health and Human Services, 1997). These current life tables were based on a complete count of resident deaths in the United States during those years. Separate probabilities were calculated for each sex within the white population, the population other than white, and the black population. The initial survival table presented the number of persons in the sample surviving to exact age x. The percent of persons who, having attained age x, will survive to age x+t was calculated by dividing x+t by x and multiplying by 100. The probability of survival by sex and race can be found in Appendix A.

3.2.3 Wages

The wage component of the cost model consists of four parts: base wage, benefits, economy-wide productivity growth, and life-cycle wage growth. Each component was derived separately and is discussed individually in the next four sections.

The Census of Fatal Occupational Injuries collects only the occupation of the worker and not the wage or salary. Therefore, the base wage for this model is an estimate or expected value of the earnings of the decedent established by the decedent's occupation at the time of death. Also because of the lack of detailed information, the model assumes that the decedent had worked full-time in that occupation and would not have changed jobs between the time of death and retirement age. The base wage is derived from the Current Population Survey (CPS), a monthly household survey of the non-institutional population 16 years of age collected by the Bureau of the Census for the Bureau of Labor Statistics (U.S. Department of Labor [BLS], 1993-2002). This population-based survey includes wage and salaried workers, the self-employed, and all agricultural workers.

The Bureau of the Census defines wages or salaries as the total income received for work carried out as an employee during a given year. It includes salaries, wages, tips, armed forces pay, commissions, piece-rate premiums, and cash bonuses earned prior to deductions such as taxes, bonds, pensions, and union dues. Also included is net income from an individual's own business, professional enterprise, or partnership, as well as from a farm operation conducted by individuals on their own account, such as an owner, renter, or sharecropper. For net income calculations, gross receipts include the value of all goods sold, services performed, payments from government farm programs, money received from farm equipment rental to others, and farm property rental. Expenses include items such as costs of goods and supplies, rent, heat, power, depreciation charges, wages and salaries paid, business or farm taxes (not personal income taxes), interest on farm mortgages; and farm building repairs. For self-employed farmers, the value of farm commodities used for family living are not included as part of net income.

Occupation and industry are classified using the 1990 Census of Population: Alphabetic Index of Industries and

Occupations from the Bureau of Census (U.S. Department of Commerce, 1992). Base wages were enumerated by detailed occupations and sex and defined as median annual earnings before taxes and other deductions.

Median wages were derived for age groups by sex, but not for each age. However, for this project, median wages for individual ages by sex were preferred because CFOI presented individual ages for each fatality. To derive median wages for each age, the median age of each age group was determined and 6-month age intervals were created. This established 20 "ages" for each age group. The CPS published median wage for a particular age group was assigned to the median age of that age group. To derive a wage value for each of the 20 ages, the difference between sequential age groups was calculated as:

$$WAG_{x+1} - WAG_{x} \qquad (5)$$

where: WAG = CPS published age group wage

This difference was evenly distributed within the age group, as there is no evidence to suggest an alternative distribution. Next, the proportion of the median age wage for each age was determined. The process was repeated for both males and females and each year of wage data. Finally, the base wage assigned to each fatality was derived by adjusting the median wage for the occupation of the decedent by the proportion associated with the age, sex, and year of death for that decedent.

Median wage data were presented in current dollars and adjusted for inflation using the Gross Domestic Product Deflator for a base year of 2003 (U.S. Department of Labor [BLS], 2002). (See Appendix B for Median Wage Data, Appendix C for Age Adjustment, and Appendix D for GDP.)

3.2.4 Benefits

To more closely represent the market value of the worker, the value of employee benefits was added to the base wage. These data were taken from the U.S. Chamber of Commerce annual survey of employee benefits administered to a sample of employers based on the distribution of U.S. employment (U.S. Chamber of Commerce, 1992-2003). The sample includes both public and private sector employers selected to represent a scientific cross-section of U.S. business by industry, size of firm and geographical region. Mean estimates of benefits were calculated using data from hourly paid and salaried employees.

Benefits as a percent of payroll for this study include the employer's share of legally required payments, retirement and savings plan payments; life insurance and death benefits payments; medical and medically-related benefit payments; and miscellaneous benefit payments such as employee education expenditures, child care, and discounts on goods and service purchased from company by employee. To avoid double counting, categories of paid rest periods, lunch periods, wash-up time, travel time, clothes changing time, get-ready time, etc., and payments for time not worked such as paid vacations, holidays, sick leave, or State or National Guard duty are excluded. These values were presented as nominal before-tax dollars for each industry group. The benefit amounts were adjusted for inflation by the GDP Deflator to a base year of 2003. (See Appendix E for Benefits)

3.2.5 Economy-Wide Productivity Growth

This growth element employs the Employment Cost Index (ECI) to estimate how much wages will rise in concert with the growth of the U.S. economy as a whole (U.S. Department of Labor [BLS], 2002). The ECI measures the change in the cost of labor and includes both changes in wages and salaries as well as employee benefits costs.

This index is based on establishment surveys of compensation costs that cover all occupations within the private and public sector. The surveys of approximately 5,000 establishments exclude farms, households, the self-employed, and the Federal Government. The 1987 Standard Industrial Classification (SIC) system was used to classify establishments by industry in the most current surveys (Executive Office of the President, 1987). After the sample is drawn, probability proportional to size sampling is used to select occupations in each of the sampled establishments. That is, a fixed number of occupations are selected in each establishment using a process that gives occupations with greater employment a greater chance of selection.

The ECI uses the current-cost approach--annual costs are calculated based on the current price of benefits and current plan provisions. The annual cost is divided by the annual hours worked to derive the cost per hour worked for each benefit. Productivity growth rate is held constant at the average of the percent changes in the ECI from 1976 to 2003. A separate rate was calculated for benefits and for salaries. This percent is an inflation free change in wages and represents an annual proxy for a change in productivity.

3.2.6 Life-Cycle Wage Growth

To account for the final component of wage growth, estimates of the life-cycle growth, or the salary growth due to experience of the individual worker, were employed. This rate was based on mean wages from the historical income tables of the Current Population Survey (CPS) for the years 1980 through 1998 (U.S. Department of Labor [BLS], 1980-1998). Mean wages were presented in constant dollars by sex, race, and age group for each year. The rate of change for mean wages was determined for each sex and race within a specific age group. Wages for the initial age group (x) was subtracted from the wages of the next age group (x+1) and divided by the initial age group wage: (x+1)-x/x. This process was repeated for male and female within each race category. For this study, it was assumed that the salary growth rate is constant within age groups–equal increments for each year of age within that age group. (See Appendix F for Life-Cycle Wage Growth Rates.)

3.2.7 Household Production

These non-market losses were derived from time-diary data captured in The National Human Activity Pattern Survey (NHAPS) study commissioned by the Environment Protection Administration (EPA) (Triplett’s work as cited in Expectancy Data, 2000). This two-stage Mitofsky-Waksberg random digit telephone dial sample design was used in the survey that covered the period from September 17, 1992 to October 1, 1994. Quarterly samples, stratified by the four major census regions (Northeast, Midwest, South, and West) and day of week (weekend versus weekday), were drawn with a total sample of 14,908 households yielding 9,386 interviews. The University of Maryland's Research Center conducted the survey interviews and requested the following for each activity the respondent performed during a 24-hour period: start and end time of the activity, actual description of the activity, location where activity occurred, and whether smoking occurred during the activity. The activities were initially coded into 11 broad categories and then into 91 micro-categories and 82 locations.

Expectancy Data regrouped these data into five super-categories: household production, providing care, hygiene and personal care, leisure, and employment and education (Expectancy Data, 2000). Further refinement classified these categories into economic allocation of work and leisure. Finally household production time was defined as activities that could produce benefit for all members of the household—housework, food preparation, cooking and cleanup; outdoor chores, plants, and animals; home and auto maintenance; and obtaining goods and services. Providing care includes childcare; child guidance; playing with children; transporting children; and, providing care to others. This sub-category was defined as the time spent providing services that are channeled toward one or more persons. The market replacement value of this time was reported in 1998 dollars and based on the hourly wages plus the employer's legally required benefit costs from the Bureau of Labor Statistics' Occupational Employment Statistics (OES) survey and the employer compensation cost report. Values of time for each sub-category were from a shorter list of the OES occupations that more accurately correlate with those activities involved in household production or providing care. Finally, daily values were distributed by age and sex for each sub-category (Expectancy Data, 2000). For this study values of household production and providing care were combined within each age and gender category and multiplied by 365 to obtain annual values. Dollar values were adjusted for inflation using the GDP Deflator. (See Appendix G for Household Production and Appendix D for GDP Deflator.)

3.2.8 Discount Rate

For public health evaluations, which normally assume a societal perspective, the social discount rate--the rate at which society as a whole is willing to exchange present costs for future benefits-- is appropriate. This implies that the discount rate should be consistent with the shadow-price-of-capital or the real riskless rate (Lipscomb, 1989). However, the value of the real riskless rate is difficult to determine. Over the years, discount rates selected for social analysis have varied from 1% to 10% (Rice et al., 1989, U.S. Department of Health and Human Services [DHHS], 1996), with the most common rate being 5% (Haddix et al., 1996). The Panel on Cost-Effectiveness in Health and Medicine (The Panel), under the auspices of the Public Health Service, recommended a 3% real discount rate, a rate exclusive of adjustment for inflation. The World Bank in 1993 concurred stating that this rate represented only the time preference. (DHHS, 1996) Because this rate is suggested for all agencies within Health and Human Services, it was selected for the initial calculations in this model.

Literature suggests that the use of a constant discount rate may be appropriate for streams of costs that occur in the same period (U.S. Environmental Protection Agency [EPA], 2000; Shefrin & Thaler, 1988; Thaler, 1985; Harvey, 1994); it may well be inappropriate for streams that span many years. (Torries, 1998; Belzer, 2000, Schelling, 2000). Methods to accommodate what may be changes in the time value of money include proportional discounting that take the form of a(t)= [b/b+t)] (DHHS, 1996). OMB issued guidelines in 1994 that called for discount rates from 2.1% for a 3-year time frame to 2.5% for 7-year time frame to 2.8% for a 30-year time period. However, The Panel disagrees by stating that adopting a non-constant discount rate would "abandon a fundamental tenet of welfare economics—namely, the stability of preferences". (DHHS, 1996) Furthermore, there is little consensus in the economic literature on social discounting for long-term flows, particularly those that span more than one generation. (EPA, 2000)

As was the case in determining the value of the discount rate, the recommendations of the Panel was accepted for this study and a constant discount rate employed. Additionally, for these calculations, cash flows were assumed to occur at the beginning of each time interval.

3.2.9 Inflation Adjustments

As well as determining the real discount rate, costs must be standardized to one time unit to ensure that all costs are comparable regardless of the year of occurrence. Cost data were converted to base year dollars. The Consumer Price Index (CPI-Med) and the Gross Domestic Product Deflator (GDP Deflator) were used to make these conversions in the model (U.S. Department of Labor [BLS], 2003; U.S. Department of Commerce [Bureau of Economic Analysis], 2004).

The CPI, a fixed-quantity price index, measures the average change in prices for a fixed set of goods and services and is calculated monthly by the Bureau of Labor Statistics. Prices are derived by sampling the prices of selected goods, including food, clothing, shelter and fuels, transportation, medical services, and then repricing that sample of selected goods at different intervals. The CPI-Med or the medical care index is comprised of two components--medical care commodities and medical care services. These components include professional medical services, hospital and related services, prescription drugs, and nonprescription medical equipment and supplies. These Laspeyres indices are defined by BLS as " the ratio of the cost of the base-period basket at this month's prices to the actual cost of the base-period basket in the base period—or the ratio of the costs of purchasing a set of items of constant quality and constant quantity in two different time periods (BLS, 2003)." (See Appendix D for GDP Deflator and Appendix H for the CPI-Medical Care.)

The Gross Domestic Product (GDP) is the total value of all goods and services produced within the U.S. economy during a specified period, which in this instance is annual. GDP can also be defined in supply rather than demand terms. This measure is also the total value of market incomes and U.S. expenditures always represents U.S. income. In short, the U.S. National Income is equal to the GDP less depreciation and indirect business taxes. The GDP

Deflator (also referred to the GDP Implicit Price Deflator) measures how much of the base year's GDP is due to changes in the price level. The GDP Deflator includes changes in the prices of all new U.S. domestically produced, final goods and services, which allows for changes in the U.S. consumption and investment patterns. Furthermore, the prices included in the GDP Deflator are for the goods and services actually produced during the current period.

Unlike the GDP Deflator, the CPI measures only the prices of goods and services typically purchased by urban consumers and represents only about 60% of the U.S. total production. The GDP Deflator is considered better suited for robust economic analysis and policy making. Therefore, the GDP Deflator was selected to adjust dollars to a common reporting year in this study. However, because the CPI-Med is a targeted price index, it was selected to adjust the medical costs to a common reporting year in this work.

3.2.10 Medical Costs

The single nominal value for medical costs in 1998 dollars of $11,276 was obtained from the Detailed Claims Information (DCI) database from National Council on Compensation Insurance (Detailed Claims Information, 1992-1995). This database provides estimates of the costs of injury and fatality to workers based on a nationally representative sample. The administrative data collected from state worker's compensation experiences contain information on injuries with lost workdays. Because each State varies in the requirements for worker's compensation payment, the number of days lost prior to inclusion in this database ranges from two to seven days. However, this limitation does not affect the reporting on information for work-related fatalities. For this study, the mean of medical costs for fatalities over a four-year period from the DCI was used. The dollar value was adjusted to 2003 dollars using the CPI-Medical Care Index.

3.2.11 Example Calculation

An example would best illustrate how this model operates. To estimate the cost of a 44 year-old white male carpenter (BOC 567) in construction (SIC 1500-1700) who died in 1996.

$P_{y,s}(n)$ = 0.99659 in first year calculation; 0.99630 in second year calculation

y = 44

s = male

n = 44 first year calculation; 45 second year calculation.

$Y_{s,j}(n)$ = [($24,752*1.125892/0.888202)*(1.00315*(((1.008627-1)/2)+1))] +

[($24,752*1.125892/0.888202)*(0.285*1.00474)] in the first year calculation**;**

[($24,752*1.125892/0.888202)*(1.00315*(((1.008627-1)/2)+1)) *(1.00629*0.986751)] +[(($24,752*1.125892/0.888202)*(1.00315*(((1.008627-1)/2)+1)))*(0.292*1.00949)] in the second year calculation**.**

$Y_s^h(n)$ = [($10,278.40/0.912958)*(1.00315)] in the first year calculation; [($10,716.4/0.912958)*(1.00629)] in the second year calculation

g = 1.00315 and 1.00474 in first year calculation; 1.00629 and 1.00949 in second year calculation.

r = 1.03^{1-1} in the first year calculation; 1.03^{2-1} in the second year calculation

0.99659 (Age 44) and 0.99630 (Age 45) from Probability of Survival

$24,752 Wages file (1996 BOC 567 Male)

1.125892 from age adjustment file

0.888202 from GDP Deflator file (1996$ row to 2003$ column)

1.00315 Year One ECI for wages and salaries (Fixed value)

1.008627 and .986751 from Career Growth file (White Male Age 44 and 45)

0.285 from the Benefits percentage file (SIC 1500-1700)

1.00474 Year One ECI for benefits file (Fixed value)

1.00949 Year Two and Beyond ECI for benefits file (Fixed value)

$10,278.40 (Male Age 44) and $10,716.4 (Male Age 45) from the Household file

0.912958 from GDP Deflator file (1998$ row to 2003$ column)

1.00629 Year Two and Beyond ECI for wages and salaries (Fixed value)

1.03 Discount rate (Fixed value)

0.292 from the Benefits percentage file (SIC 1500-1700)

$^{1-1}$ and $^{2-1}$ Iteration of calculation minus 1

The following are used in calculations for the first year only.

$11276 Medical cost (Fixed value)

0.814877 Medical Care CPI file (1998$ row to 2003$ column)

For the first year estimate, the wage, benefit, and household production values are summed and multiplied by the probability of survival (determined by the age of the person at the time of death), which is then discounted at 3% rate or divided by 1.03^{1-1} or 1, and added to the fixed medical cost adjusted for medical inflation.

The wage, benefit, and household production values are summed and multiplied by the probability of survival (determined by the age of the person one year from the time of death), which is then discounted at 3% rate or divided by 1.03^{2-1} or 1.03 for the second year estimate.

3.3 COMPUTER APPLICATION PROGRAM

This study used the FRAME entry in SAS/AF software to design menu-driven, interactive windowing applications with the SAS System. FRAME entries uses object-oriented concepts to permit building graphical user interfaces, which allow quick and easy maneuvering through tasks using graphical images.

SAS Institute describes this system as a

> new type of programming theory, object-oriented programming (OOP), is employed to build windowing applications. These OOP concepts give FRAME entries the enhanced functionality and flexibility to create more graphically oriented applications…….object oriented programming is a technique for writing computer software and applications…..a term refers to the methodology of developing software in which the emphasis is on the data and the procedure or program flow is de-emphasized. Concentrate on the data in the program and the operations you perform on that data. In OOP theory, application design consists of analyzing data and grouping them into similar categories upon which similar actions are performed. (SAS, 1993).

Chapter 4

Results

This chapter presents the components of the computer application program. It also presents information on operational issues such as speed and ease of use of the program. The second section presents the results of the estimation process through the application program. Finally, estimations of the cost of traumatic occupational fatalities by selected characteristics are presented.

4.1 Computer Application Program

This computer application program is capable of producing estimates of the total, mean, and median lifetime costs of occupational fatal injuries as captured within the Census of Fatal Occupational Injuries (CFOI). However, to ensure that the system could accommodate other injury databases, data from the CFOI was replaced with data from the National Traumatic Occupational Fatalities (NTOF) surveillance system. Similar estimates were produced using NTOF.

The program allows the user to select up to 13 variables to estimate the societal burden of premature work-related deaths. Each variable represents a characteristic of the fatality in differing degrees of detail. The 13 case and demographic variables are: year of death; age, sex, and race of the decedent; the state where the injury occurred, the industry that employed the decedent; the occupation of the decedent at the time of death; the nature of the fatal injury, the part of body affected, the source of fatal injury, the event or exposure associated with the fatal injury; and the activity and location of the decedent at the time of death. These variables can be selected in numerous combinations to derive the estimate of interest. See Appendix I for an example of estimating the cost of traumatic occupational fatalities based on selected characteristics.

Estimates were created for every major characteristic by year to ensure that the estimates would be produced and would be reasonable in magnitude (see Tables 4.1-4.22). Selected estimations were derived more than once to ensure repeatability of the estimate. The program was launched on three different computers with selected estimates derived and compared.

On average, the program calculated the estimated cost of a year of fatalities in five seconds; a rate of approximately 1,250 fatalities per second. The windows-based application program is extremely user friendly. Researchers from the Division of Safety Research within NIOSH were requested to calculate costs independently. They identified the characteristics of the estimation desired prior to entering the program. All staff derived the appropriate estimation without assistance.

4.2 Cost-of-Illness Estimates

The overall goal of this study was to produce a user-friendly computer program capable of producing improved, reproducible, and defendable values of the dollar impact of traumatic occupational fatal injury for use by the occupational safety and health community. It was not intended to be a study or analysis of the cost estimates. However, to ensure that the program was functioning correctly, cost estimates for all major characteristics by year were derived. Activity and location of the decedent at the time of death as well as the State of injury variables are not hierarchical in structure and only aggregate numbers were presented in this study. The following is meant to be only a cursory analysis of those resulting costs. Future studies will be responsive to the need for a thorough investigation of the relationship between the cost of fatalities and the associated characteristics as well as trend analysis.

Over the 10-year period of 1992 through 2001, CFOI reported 59,017 fatal occupational traumatic injury deaths, ranging between the high of 6,303 in 1994 and the low of 5,664 in 2001 (Appendix Table 1). The total lifetime cost to society of these premature deaths ranged between the most burdensome in 1994 at just over $5 billion, to the least burdensome in 1999 at $4.7 billion. The total cost for all 10 years was nearly $49 billion (2003 dollars). Generally, the higher the number of fatalities, the greater is the societal burden. However, there are several exceptions such as the number of fatalities is fewer in 2001 than 1996, but the total cost is larger in 2001 than in 1996. To explain this phenomenon leads us to examine the average cost of a fatality by year.

The mean lifetime costs ranged from $801,638 in 1996 to $880,805 in 2001 and the median lifetime costs ranged from $812,204 in 1996 to $875,898 in 2001(Appendix Table 4A1.). 2000 and 2001 experienced the fewest number of fatalities, however, they experienced the highest mean ($867,181 and $880,805 respectively) and median costs ($876,015 and $875,898 respectively). The lowest mean and median costs were found in 1996 ($801,638 and $812,204 respectively). The mean costs for 2001 were nearly 10% greater than the lowest mean found in 1996. Similarly the highest median costs were nearly 8$ higher than the lowest median costs. Except 1992 and 2001, the median cost of an occupational fatality is higher than the mean cost which is indicative of a negatively skewed distribution—there are costs on the lower end that are disproportionately decreasing the mean value. Overall the mean lifetime cost for the period was $825,271and the median was $831,786.

Contrary to expectations based on human capital theory opponents, the estimated mean and median cost of fatal occupational injuries to women was higher than the cost of fatalities to males (Appendix Table 2 and 3). This relationship did not exist in all years—1992, 1995, and 2000 were opposite. As was the case in the overall estimates, the median cost was generally greater than the mean cost for the majority of years and sex (Appendix Table 3). The exceptions for males occurred in 1992 and 2001. For females the exceptions were in 1994, 1996, 1997, 1999, and most importantly in the average of all years.

Similarly, those decedents identified as white experienced the highest total lifetime costs for these years (Appendix Table 6). Costs ranged by race from a high of nearly $41 billion for those classified as White to a low of just over $3 billion for those classified in the Other category. Throughout the years, the total lifetime costs for those classified as White were highest and those classified as Other were lowest. The mean and median costs showed a nearly identical pattern (Appendix Table 7). Overall, the estimated mean and median costs for those decedents identified as White were the highest—$828,714 and $839,012 respectively. For the ten-year study period, mean costs for the Black classification were lower than the Other classification--$796,709 and $825,210 respectively. This pattern held true for each year until 2000. In 2000 and 2001, the Other classification had the highest mean costs, then the White classification, followed by the Black classification. In 2001, the lifetime mean cost of the Other classification was 3.5% greater than the White classification and 4.5% greater than the Black classifications. By contrast, the Other classification mean cost was 8% greater and the White classification 7% greater than the mean cost for Blacks in 1992. Finally, on average, median costs were higher for the Black classification ($804,204) than for those classified in the Other category ($799.028).

The greatest number of fatalities occurred in the 35-44 year old age group, as did the highest total lifetime cost (Appendix Table 4). Three age groups, 25-34, 35-44, and 45-54 accounted for two-thirds of all fatalities and just over three-fourths of the total lifetime costs. The fewest number of fatalities occurred to those in the 16-19 year old age group, while the lowest total cost was found in the 65 and over age group. Generally the highest mean and median costs were associated with the 35-44 year-old age group for all years combined as well as individual years (Appendix Table 5). The exceptions were in years 1999 and 2001 when the 25-34 year-old age group was slightly higher. For all years, the lowest mean and median costs were found in the 65 and over age group.

During this time period, the highest total lifetime costs of occupational traumatic injury was seen in the construction industry—nearly $9 billion, or nearly 20% of the overall burden both in costs and number of fatalities (Appendix Table 8). The transportation and public utilities industry division contributed an additional 18% of the overall cost and 16% of the number of fatalities. In every other industry division, with the exception of the agriculture, forestry, and fishing industry, the proportion of all fatalities mirrored the proportion of overall costs. For the agriculture industry, workers experienced 13% of the overall fatalities, but contributed only 8% to the overall costs. The mean costs for the ten-year study period for the agriculture division, the wholesale trade division, and the retail trade division were lower than the average mean cost for all industries. The same pattern held true for median costs, except for the manufacturing division was lower and wholesale trade division was higher. Generally, the median cost for an industry division was higher than the mean cost for that same industry division in each year. The exceptions were the services industry division and the manufacturing division where the mean cost was nearly always higher than the median cost. Additionally, the industry divisions' mean and median costs in 2001 were higher than in 1992.

The total lifetime cost of traumatic occupational fatal injury for these years ranged from nearly $4 billion for those employed in the service occupations, to nearly $16 billion for those employed in operators, fabricators, and laborers occupations (Appendix Table 10). The second highest total cost was found in precision production, craft and repair occupations, with a total of just over $10 billion, also ranked second in the number of fatalities. All categories showed an increase in total cost from 1992 to 2001 the technical, sales, and administrative support except occupations moving from nearly $750 million in 1992 to just under $600million in 2001 and the managerial and professional specialty occupations moving from $771 million to $726 million. The highest mean and median lifetime costs were in the managerial and professional specialty occupational category (Appendix Table 11). This mean cost was nearly 2-1/2 times greater than the estimate for farming, forestry, and fishing occupations, which was the lowest for all categories; the median for the managerial and professional specialty occupational category was over double that of the lowest category of farming, forestry, and fishing occupations. The highest mean value for each occupation group occurred in 2001. Nearly all categories saw a lower lifetime mean and median estimate in 1992 than in 2001. The exceptions included technical, sales, and administrative support occupations with higher median costs in the earlier year, $960,496 compared to $909,427.

Not unexpected, over 99% of the fatalities were classified as traumatic injuries and disorders using the nature of injury categories (Appendix Table 12). This category accounted for the same percentage of the total lifetime costs of occupational fatal injuries. These proportions were nearly identical in each year. The only other categories with counts that met BLS required publication criteria were systemic diseases and disorders and infectious and parasitic diseases. Overall, the mean and median costs of traumatic injuries and disorders were higher (ranging from 18% to 29% higher than the next highest category) than those experienced in the remaining nature of injury categories (Appendix Table 13). One exception to this relationship occurred in 1995 when the mean and median costs for systemic diseases and disorders were higher than the traumatic injuries and disorders category.

Just over $21 billion dollars was the total lifetime cost of occupational fatal injuries where the vehicle was named as the substance or object that directly inflicted the injury (Appendix Table 14). This category represents over 40% of the total burden of occupational fatalities, measured in both in dollar and number of lives. This proportion remained relatively constant in each year. The only other single category that accounted for more than 10% of the total burden was structures and surfaces, with a total lifetime cost of over $5.6 billion (12%) and 7,349 (over 12%) fatalities. Despite the overwhelming dominance of vehicles in the frequency and total lifetime costs, the mean and median lifetime costs for chemicals and chemical products were highest among all source of injury categories (Appendix Table 15).

Transportation accidents had the highest overall total lifetime costs of fatal injury, accounting for 43%, or $21 billion, of the burden for all incidents during 1992-2001 (Appendix Table 16). This same category also accounted nearly 25,000 fatalities and the same proportion as the burden. The category of assaults and violent acts had the second highest total costs with costs at just under $9 billion, which accounted for just over 17% of the total burden. The estimated mean cost of incidents involving exposure to harmful substances or environments was nearly $900,000, a value higher than any other single category (Appendix Table 17). Those incidents involving falls had the lowest estimated men value of just over $750,000. With no exception, the mean lifetime cost of a fatality increased from 1992 to 2001. The increase from 1992 to 2001 ranged from 3% for incidents involving falls and fires and explosions to 19% for those involving bodily reaction and exertion. Fires and explosions had the highest average median lifetime cost of $923,000 and carried the highest median value in 2001 of nearly $978,000. This

compared to the lowest average median values of $782,000 for incidents involving contact with objects and equipment and $825,000 for incidents involving falls during the year 2001.

Other state or U.S. highways was the most frequently identified location classification, accounting for nearly 8% of the total number of locations identified (appendix Table 18). Moreover, highways, streets, or freeways together accounted for over 25% of those locations identified. These same categories always presented the highest total lifetime costs—with Other state or U.S. highways being the greatest at just over $4billion. However, examination of the mean cost of incidents revealed that mining had the largest toll. Three of five most burdensome locations, as measured by the mean costs, were mines, quarries, and tunnels under construction—all with mean costs of about $1million. Five of the seven highest median values were from incidents in mining locations—ranging from $968,000 for mines and quarry, not elsewhere classified to $1.1 million for the category mine. These estimates can be compared to those of the Other state or U.S. highway locations with a lifetime mean cost of $858,000 and a lifetime median cost of $914,000.

The activity of the decedent at the time of death was most often classified as driving a truck—nearly 13% of those activities which could be classified (Appendix Table 19). Combined with the second most classified activity was driving an automobile. These two categories accounted for nearly 20% of the fatalities and 21% of the overall lifetime total costs of fatal occupational injury; a total of over 11,400 deaths and nearly $10 billion. Activities associated with airplane transportation—riding in or piloting an airplane—had the highest estimated lifetime mean costs of fatal occupational injury at $1.2 and $1.4 million respectively. The same order was true for the lifetime median costs estimated at $1.3 and $1.6 million respectively. Farming activities had the lowest mean and median lifetime costs, with the lowest estimated at $286,000 and $64,000 respectively.

Table 20 presents the number and lifetime costs of occupational traumatic fatal injury by the state where the injury occurred. California, Texas, Florida, Pennsylvania, Illinois, and Georgia all have more than 2,000 fatal injuries during this ten-year study period. California and Texas have total lifetime costs of $5 billion and $4 billion, the highest among all states. Vermont had the fewest number of fatalities and the lowest total lifetime costs, with just over 100 fatalities and nearly $32 million in total lifetime costs. As has been the cases with previous characteristics, those at the top of the list for frequency and total costs are not the same as those with the highest mean and median lifetime costs. The top four—Alaska, Louisiana, New Hampshire, and Utah, have mean lifetime costs of over $900,000. Interestingly, the median for Alaska is among the ten lowest costs. North Dakota and Iowa have the lowest lifetime mean costs at $668,716 and $695,730 respectively. There are only fourteen states with mean lifetime costs less than $800,000. North Dakota, South Dakota, and Iowa have the three lowest median lifetime costs. Only North Dakota has a cost under $700,000.

Because of uncertainty in the appropriate discount rate, further sensitivity analyses were conducted using the same ranges as previous researchers—from 0 to 10%. The lower bound reflects what happens in the absence of any time preference of money; the upper bound can be thought of as a ceiling on the real consumption rate in current markets. Table 21and 22 present estimates using 0, 3, 5, and 10-percent discount rates respectively by year. The 0% discount rate estimations are nearly 3 times larger than the 10% discount rate. The 3% rate is approximately twice that of the 10% rate and 1-1/4-times higher than the 5% rate. Furthermore, the choice of the discount rate can affect the relationship between the estimated costs of specific groups. For example, employing a 0% discount rate yields a mean cost of $1,338,500 per case for the 16 to 19 years old age group and a mean cost of $72,541 per case for the 65 and older age group. By contrast, a 5% discount rate yield costs of $507,244 for the 16-19 year old age group and $71,687 for the older age group. Finally, using a 10% discount rate yields a mean cost of $288,668 per case for the younger age group and $70,927 for the 65 and older age group. The difference between the value of a fatality for an older and younger worker diminishes as the discount rate is increased.

Chapter 5
Summary and Conclusions

The model presented in this dissertation provides estimates of the economic cost of occupational injury fatalities to society. It is a viable means to obtain estimates of the costs of these traumatic occupational fatalities by selected characteristics. Overall, the model estimated the mean cost of an occupational fatality at just over $825,000 in 2003 dollars for a total loss of nearly $50 billion. Generally, estimates were higher for middle-aged workers than workers in the youngest and oldest age groups, higher for white workers than workers of other races, and higher for female workers than male workers.

5.1 DISCUSSION

The first objective of this research was to determine the appropriate theory for use in public health organizations with the mission to improve the safety and health for all workers in the United States. The measures of appropriateness included the availability of the data required for deriving estimates, the ease of deriving the estimates, the ability of the user to understand and accept the estimates, and the relative expense of deriving these estimates given current budgetary atmosphere of producing more results with fewer dollars. Finally, the theory had to be generally accepted by researchers in the field of occupational safety and health.

The second objective was to develop a program to calculate the lifetime cost to society of occupational fatal injury by worker and case characteristic. To be successful, the program must calculate values in reasonable time, be relatively easy to operate, and be compatible with the current software programs used in public health agencies, particularly the National Institute for Occupational Safety and Health, the Bureau of Labor Statistics and their participating CFOI states.

Once these objectives were met, the overall goal of the study, to calculate improved, reproducible, and defendable costs of occupational fatal injury by the attributes of the deceased worker and by characteristics surrounding the fatal incident, was accomplished.

5.1.1 Theoretical Model

Gathering the necessary data for this model proved to be more labor intensive than anticipated. Efforts to identify and examine data for the model proved most problematic. However, the amount of time and labor to update data for the maintenance of the model should decrease over time. This method still required less time and money to arrive at cost estimations than would alternative theoretical approaches. Additionally, the majority of the data is in the public domain and therefore available without cost.

As documented in the literature, researchers have used several methods to calculate the value of life. For this study, the cost-of-illness method was employed. There is sufficient support in the safety and health community to defend the selection of this theoretical approach.

For example, The U.S. Department of Agriculture states:

> "Any COI can be disaggregated to examine the direction of the economic flows resulting from illness and premature death. If this step is taken, the COI approach can reveal not just the magnitude, but the distributional consequences of illness. COI is therefore a useful tool for gauging the extent and distribution of the costs of adverse health outcomes. It is a first step in deciphering the economic distortions triggered by illness and premature death." (Kuchler & Golan, 1999, p. 15)

The National Institute of Health (NIH) uses COI estimates routinely for congressional testimony, in scientific publications to support increases of funding for health research, and as a tool to allocate research dollars among competing research projects. NIH has submitted Congressional reports showing estimates of the societal cost impact of selected diseases in 1995, 1997, and 2000. On page four of their latest report, they state "COI estimates can provide order of magnitude indicators of the economic burden of particular diseases…..COI estimates can help decision-makers in Congress and in the Administration anticipate and respond to public interests" (Varmus, 2000).

The RAND Institute gave a similar, but more convincing testimony on the acceptability of COI when they stated

> …the human capital approach invariably produces much smaller estimates for the value of life than the theoretically more well-grounded, willingness-to-pay concept….However, because the courts have allowed only the latter (cost-of-illness) approach, using another approach would make our research irrelevant to any major public policy issues... (King & Smith, 1988, p.11).

In a 2000 response to criticism in *Injury Prevention*, Dorothy Rice reaffirmed her position regarding the appropriateness of using the cost-of-illness approach. She states that COI estimates "translate the adverse effects of diseases or injuries into dollar terms, the universal language of decision makers and the policy arena". Furthermore, "Cost of illness studies provide an important guide and resource for policy development, priority setting, and management of public health." (Rice, 2000, p. 2)

According to the National Safety Council, "(COI) estimates represent income not received or expenses incurred because of fatal injuries or illnesses and therefore may be compared to other economic measures such as gross domestic product, per capita income, or personal consumption expenditures" (NSC Accident Facts 1996 edition, p. 146). This supports the use of this theoretical approach in public health analysis especially when employing a societal perspective.

As for the public health institute NIOSH, the theoretical model has been widely accepted and understood during initial discussions with economic researchers as well as with middle and executive management. The full extent of the model's impact is yet to be known.

5.1.2 Computer Application Program

The ease of modification is perhaps the greatest strength of the program. The program is designed with each element required for calculation as a separate database. Wages and benefits can be updated by adding an additional column of data to the existing file or replaced completely by changing the address found in the execution program. Updates for traumatic occupational fatalities are accomplished in a similar manner. Additionally, the discount rate can be altered with ease.

The computer program has the flexibility to calculate estimates of the lifetime cost of occupational injury sufficiently robust for economic analysis. The program can express the estimates in dollar values ranging from 1992 nominal dollars to 2003 nominal dollars. The program can employ various discount rates to accommodate either differing assumptions concerning the value of time or changes in the economy that would alter the "true" value of time. The program is also sufficiently simplistic and equipped with safeguards to reduce the incident of error by users who are not familiar with economic concepts or have limited computer skills. Finally, the program adheres to the NIOSH pledge of confidentiality by not allowing the cost of fewer than 3 fatalities to be estimated.

5.1.3 Estimates

In addition to the computer applications program accomplishing the goals of this study, the estimates derived are well within the norms of previous research efforts. Unfortunately, there are few studies that separate mortality and morbidity estimates or separate injury and illness estimates. However, the overall values and estimates where limited to a subsection of the population examined in those few studies, proved to be reasonably comparable to the results found in this study. Where differences were found, they were readily explained. It should be noted that the differences between the estimates from this study and those of similar COI studies should always be viewed in light of the alternative estimation system of willingness-to-pay. Willingness-to-pay estimates, which in general range from $3-7 million, are significantly different from all COI estimates.

The cost of injury presented in a 1989 report to Congress (Rice, 1989), was estimated at $307,637 ($660,000 in 2003 dollars) per fatality using COI. There are a number of reasons the estimates are somewhat lower than reported in this study. The Rice estimate used different sources of data, and based the value of household production on the prevailing wage for the task rather than the opportunity cost to the decedent. Additionally, the study employed annual mean earnings of the decedent that were not linked to the occupation of the decedent. Depending on the overall distribution of lower income workers, this could have a significant influence on the total cost estimates. In addition, as evidenced in the CPS, annual mean earnings are typically much higher than median earnings that were employed in this study. Furthermore, Rice recognized and documented that the mortality cost may be overestimated for decedents with lower than average earnings. The Rice study was also used to estimate the cost of all fatal injuries, not just work-related deaths. Finally, estimations were calculated in the aggregate and then divided by the estimated number of fatalities. The effect of all these differences may explain some of the difference between these two cost estimates.

A 1988 Pennsylvania study (Neumark, et al., 1991) estimated the value of fatal occupational injuries and illnesses in that state to be between $1.96 billion and $2.82 billion using cost-of-illness methods. Neumark altered the retirement age, productivity growth, and the discount rate to develop three distinct estimates--$296,000, $388,000, and $511,000 per fatality in 1992 dollars. None of the discount rates or the retirement ages selected matched this study. In addition to these methodological differences, his inclusion of fatal occupational illnesses created an even larger disparity between the cost estimates in the two studies. Finally, Neumark made no adjustments for individual salary growth. Despite these differences, this study's estimates per fatal occupational injury compare favorably to this study. 1992 fatality losses estimated in 1999 dollars from this model compared to the estimates from the Neumark study inflated to 1999 dollars are as follows: $406,323 to $351,487; $600,235 to $460,733; $737,780 to $606,790.

The state of New Jersey estimated the cost of occupational injury fatalities for the year 1992 at just over $1 million dollars per fatality (Roche, 1995). This number is substantially higher than the estimate produced by this study ($654,000). One explanation is the use of New Jersey-specific costs, which are substantially higher than national costs. New Jersey employed an upward adjustment of 1.333. Considering the increase in the initial wages of the decedent, the overall impact on the final estimate will exceed that of the 1.333 adjustment factor. Additionally, the study did not account for the probability of survival from one age to the next. Furthermore, the study used wage data that was specific to age and sex but not to occupation. Age, sex, and occupation characteristics associated with fatalities within a specific state may differ from the national distribution. Depending on that distribution, the estimates could be biased either upward or downward. Finally, as seen in the prior studies, Roche included additional direct costs increasing the overall value by an estimated $30,000-$40,000 per fatality.

The National Safety Council (NSC) estimated that a fatal occupational injury cost $1,100,000 in 2003 (National Safety Council, 2004). This estimate includes a number of additional direct costs, which include administrative expenses, police costs, travel delay costs, and employer costs for productivity losses by employers. The indirect costs were calculated in a similar fashion; however, the NSC used different data sources that could also lead to differing cost estimates. Finally, because the cost per fatality is disaggregated from an overall cost to society, the number of fatalities included in the estimate could bias the estimates upward.

In addition to specific studies, there is also anecdotal evidence that suggests this study's estimates are reasonable. For example, the highest costs for any specific incident are those associated with airline incidents. The mean lifetime cost of airline incidents, $1.4 million, is over 1/3 higher than the next highest mean value for two-digit event or exposure categories. This high mean cost bears out the 1988 RAND study's assumptions that those traveling on airlines tend to have higher wages.

5.2 LIMITATIONS OF THE STUDY

Although this theoretical model is easy to understand, relatively easy to calculate, and the necessary data is inexpensive to acquire, it is not without limitations. The human capital measure is often criticized because it ignores one of the fundamental constructs of economic theory--the individual's preferences. Another concern of this approach is the reliance on the market earnings to represent the value of life. Using these values underestimates the value of most working minority groups and youth, if the market failures or imperfections result in an inequitable distribution of wages and salaries. If earnings are lower for a specific age group, ethnicity, or sex, such as lower wages for black compared to white workers in the same occupation, this deviation will be incorporated into the human capital measure.

This model produces a conservative, if not lower bound, estimate for lifetime economic costs of traumatic occupational fatalities. This is in part due to limitations in the specification of the model and limitations associated with the data. This study does not provide a "complete" cost of occupational fatalities in that intangible losses that are associated with premature death are not included. While intuitively appealing, the costs of these losses—pain, suffering, and emotional damage to the injured and the family—are immeasurable. (Fahs et al. 1989). Despite the claim that these losses can not be measured, researchers have attempted to derive a proxy for such costs (Miller, et al., 1995). By including such estimates, these researchers may be inappropriately intertwining theoretical models.

In addition to the limitations associated with the economic theory, there are a host of probable limitations associated with the data sources themselves. Although considered the "gold standard," the Census of Fatal Occupational Injuries, may be an undercount of the total number of fatalities. The system is also at the mercy of individual coders from each State to determine the characteristics of the decedent at the time of death. From previous unpublished work of this author, more than a 70% agreement between any two coders on a routine basis was considered an unreasonable expectation. In addition to possible coding bias, the differing skill levels of those completing the death certificate and gathering information regarding the decedent's characteristics can create error in collection. Some variables are more susceptible to this problem than others. For example, it is unlikely that the sex of the decedent would be recorded wrong, but the occupation of the decedent could vary drastically depending on the source of information. A grieving widow may not wish to refer to her loved one as a garbage collector, but may prefer a sanitary engineer. Estimates produced by the model would be quite different for those two occupations.

The location of the incident and the activity of the decedent are also captured in the CFOI data. Unfortunately, these elements have a substantial proportion of unclassified entries. Despite that limitation, the available information could be useful. For example, using the other variables found in the data it is impossible to identify those incidents occurring in convenience stores, those on a residential construction site, or in a manure pit. Similarly, without the activity structure it would be impossible to identify if the decedent was a pilot or passenger in an airplane incident, crossing a street as opposed to walking behind a vehicle, or removing a jam from equipment as opposed to operating the equipment.

Many of the limitations of this study are also associated with wage data or model specification for wage calculation. Second- or multiple-job information for the decedent is not available on the source documentation; therefore, the wage calculations do not account for these additional losses. The wage calculations do not include a mechanism for identifying changes in career that may have occurred had the worker lived. For example, there is an downward wage bias for the younger worker because a younger worker will be assigned the median annual wage for the occupation at the time of death. Under most circumstances, a younger worker's occupation changes as they complete their education or training. Because of these limitations, this model will underestimate the full economic loss of premature traumatic occupational fatalities.

State specific results from this model may not be representative of the true burden. The model relies heavily on the age and the wage of the decedent at the time of death. Because the wages employed by this model are national medians, the resulting costs may be underestimates if wages in the state of injury are higher than the national average. Conversely, the resulting costs may be overestimates if the wages in the state of injury are lower than the national average. However, despite this limitation, the model provides cost estimates that can be used to target leading events, industries, or occupations.

5.3 FUTURE RESEARCH AND MODEL ENHANCEMENTS

This study provides a user-friendly computer program that estimates the total, mean, and median economic losses of traumatic occupational fatalities that are comparable to those estimates from prior studies. However, there are a number of economic model enhancements and additional research that will improve the utility of these estimates.

These estimates are conservative lifetime costs of fatalities as the model includes only one direct cost category—medical expenses. Additional direct cost categories were intentionally excluded because of their individual limitations. For example, the most recent estimates for administration costs available at the time of model specification dated to work done in the 1980's. Exploration of improving or updating the estimations for legal and administration costs, property damage, travel delay costs, and funeral and coroner costs should be undertaken. Furthermore, medical costs used for this study were a three-year average of worker's compensation claims from a sample of states. The cost of securing medical costs from this source on a regular basis would be prohibitive. Therefore, it would be prudent to explore alternative sources for these costs and ascertain the comparability of values among the sources.

Further improvements in the wage data should include employing state-specific estimates rather than national estimates. Currently, this is impossible because classification of occupations in the wage data and CFOI are not compatible. Beginning with 2003 data, CFOI and the state wage data will have identical occupational classification systems, which will allow employing state-specific wage estimates. Additionally, the accuracy of the cost estimates would benefit from a comprehensive analysis of the career growth rate patterns. A longitudinal cohort study would shed needed light on the best method of deriving these estimates for the overall population.

General discussions among cost-outcome researchers have evoked concern about the accuracy and appropriateness of using a cross-sectional cohort to estimate the probability of survival. The Social Security Administration has conducted some preliminary work to address this criticism by calculating probabilities based on a longitudinal study (Ted Miller, personal communication, May 15, 2000). As these studies progress further exploration for this application should be undertaken.

With the validation of the operational aspects of this model, it is imperative that additional detailed studies of the impact of individual groups or characteristics associated with the occupational incident be explored. For example, the higher lifetime costs associated with female workers compared to their male counterparts was not anticipated by theory. Future studies could answer such questions as the following:

- Were the ages of the female decedents substantially different than males?
- Were the occupations of female decedents substantially different than males?
- Were there female outliers creating these unexpected lifetime costs?
- Were female decedents in substantially different industries than males?
- Are the forecasts for these lifetime costs expected to change based on changing employment and demographic characteristics of females?

Additional questions that should be addressed include, but are not limited to:

- What was the underlying driver for the mean costs for Black classification being lower than for Other race classification while the median was higher?
- What effect is the changing age of our workforce having on the GDP impact? Will the age categories with the highest mean costs change as our workforce ages?

Finally, researchers should conduct trend analysis to help determine the best allocation of resources that are continually becoming scarcer. The goal of the U.S. occupational public health system research is to identify the causes of work-related injuries and diseases, to evaluate the hazards of work practices and new technologies, to develop ways to control these hazards, and to work in conjunction with OSHA by making recommendations for occupational safety and health standards. Using economic losses, as those calculated using this model, is one means to determine the greatest need.

TABLES

Table 1. Number and Total Lifetime Cost of Occupational Traumatic Fatal Injury by Year, 1992-2001 (2003 Dollars)

Year	Number of Fatalities	Mean Cost	Median Cost	Total Cost
All Years	59,017	825,271	831,786	48,705,018,420
1992	5,833	819,735	814,340	4,781,514,477
1993	5,986	819,463	828,230	4,905,306,114
1994	6,303	820,133	820,548	5,169,299,277
1995	5,959	820,721	827,215	4,890,676,844
1996	5,899	801,638	812,204	4,728,862,237
1997	6,013	806,902	822,550	4,851,903,254
1998	5,840	813,489	818,178	4,750,777,818
1999	5,827	806,751	830,625	4,700,939,270
2000	5,693	867,181	876,015	4,936,861,071
2001	5,664	880,805	875,898	4,988,878,059

Table 2. Number and Total Lifetime Cost of Occupational Traumatic Fatal Injury by Sex and Year, 1992-2001 (2003 Dollars)

Year of Death	**Male**		**Female**	
	Number of Fatalities	Total Cost	Number of Fatalities	Total Cost
All Years	54,342	44,805,438,840	4,675	3,899,579,580
1992	5,407	4,438,754,812	426	342,759,664
1993	5,517	4,517,846,627	469	387,459,487
1994	5,789	4,737,250,679	514	432,048,598
1995	5,447	4,473,516,269	512	417,160,575
1996	5,402	4,328,899,834	497	399,962,403
1997	5,547	4,457,375,452	466	394,527,802
1998	5,373	4,354,581,215	467	396,196,603
1999	5,396	4,349,401,163	431	351,538,106
2000	5,257	4,571,287,011	436	365,574,060
2001	5,207	4,576,525,778	457	412,352,281

Table 3. Number and Average Lifetime Costs of Occupational Traumatic Fatal Injury by Sex and Year, 1992-2001 (2003 Dollars)

Year of Death	**Male**			**Female**		
	Number of Fatalities	Mean Cost	Median Cost	Number of Fatalities	Mean Cost	Median Cost
All Years	54,342	824,508	831,594	4,675	834,135	833,729
1992	5,407	820,927	815,077	426	804,600	805,855
1993	5,517	818,896	825,594	469	826,140	852,994
1994	5,789	818,319	818,320	514	840,561	837,078
1995	5,447	821,281	828,131	512	814,767	816,152
1996	5,402	801,351	813,948	497	804,753	796,909
1997	5,547	803,565	822,394	466	846,626	827,478
1998	5,373	810,456	813,965	467	848,387	867,312
1999	5,396	806,042	833,133	431	815,634	813,709
2000	5,257	869,562	878,768	436	838,473	840,138
2001	5,207	878,918	875,644	457	902,303	903,641

Table 4. Number and Total Lifetime Cost of Occupational Traumatic Fatal Injury by Age Group and Year, 1992-2001 (2003 Dollars)

Year of Death	**16-19 Years**		**20-24 Years**		**25-34 Years**		**35-44 Years**	
	Number	Total Cost	Number	Total Cost	Number	Total Cost	Number	Total Cost
All Years	1,481	1,041,876,815	4,345	3,801,397,673	12,665	13,260,957,970	14,821	15,727,591,052
1992	132	85,977,994	475	400,587,782	1,437	1,486,153,760	1,457	1,508,466,182
1993	128	86,991,761	466	404,738,792	1,413	1,450,856,484	1,493	1,553,064,614
1994	140	95,255,728	496	410,491,332	1,457	1,500,150,444	1,561	1,635,526,079
1995	155	107,736,428	431	373,790,240	1,318	1,353,960,741	1,512	1,598,537,905
1996	162	108,726,172	397	338,883,398	1,273	1,263,963,525	1,521	1,585,967,940
1997	144	99,807,820	466	402,308,510	1,264	1,304,185,983	1,476	1,528,930,548
1998	157	110,357,468	395	345,814,756	1,185	1,230,440,200	1,488	1,558,264,579
1999	160	113,274,055	408	361,606,707	1,124	1,179,970,747	1,465	1,527,866,754
2000	157	116,818,726	410	381,558,286	1,109	1,237,532,143	1,422	1,605,562,687
2001	146	116,930,663	401	381,617,868	1,085	1,253,743,943	1,426	1,625,403,764

Table 4. Number and Total Lifetime Cost of Occupational Traumatic Fatal Injury by Age Group and Year, 1992-2001 (2003 Dollars), continued

Year of Death	**45-54 Years**		**55-64 Years**		**65+ Years**	
	Number	Total Cost	Number	Total Cost	Number	Total Cost
All Years	12,410	10,781,551,656	8,099	3,717,447,931	5,196	374,195,324
1992	1,130	945,677,759	743	322,532,590	459	32,118,409
1993	1,176	1,032,277,220	787	342,057,103	523	35,320,140
1994	1,270	1,107,615,474	851	386,205,810	528	34,054,412
1995	1,218	1,048,739,795	808	370,978,513	517	36,933,221
1996	1,199	1,015,935,999	837	378,675,751	510	36,709,452
1997	1,275	1,091,847,289	862	386,756,281	526	38,066,823
1998	1,238	1,080,034,297	827	385,000,407	550	40,866,110
1999	1,297	1,102,249,523	804	374,271,049	569	41,700,434
2000	1,284	1,158,539,288	820	399,602,727	491	37,247,214
2001	1,323	1,198,635,012	760	371,367,700	523	41,179,109

Table 5. Number and Average Lifetime Costs of Occupational Traumatic Fatal Injury by Age Group and Year, 1992-2001 (2003 Dollars)

Year of Death	**16-19 Years**			**20-24 Years**			**25-34 Years**			**35-44 Years**		
	Number	Mean Cost	Median Cost	Number	Mean Cost	Median Cost	Number	Mean Cost	Median Cost	Number	Mean Cost	Median Cost
All Years	1,481	703,495	668,331	4,345	874,890	825,588	12,665	1,047,056	1,002,791	14,821	1,061,169	1,009,875
1992	132	651,348	625,477	475	843,343	796,487	1,437	1,034,206	977,335	1,457	1,035,323	965,556
1993	128	679,623	646,964	466	868,538	820,811	1,413	1,026,792	984,973	1,493	1,040,231	988,124
1994	140	680,398	646,560	496	827,603	786,574	1,457	1,029,616	973,955	1,561	1,047,743	1,003,118
1995	155	695,074	668,737	431	867,263	820,830	1,318	1,027,284	998,041	1,512	1,057,234	1,009,783
1996	162	671,149	641,364	397	853,611	813,111	1,273	992,901	975,016	1,521	1,042,714	988,710
1997	144	693,110	654,667	466	863,323	823,838	1,264	1,031,793	1,007,508	1,476	1,035,861	1,014,826
1998	157	702,914	652,171	395	875,480	832,327	1,185	1,038,346	999,728	1,488	1,047,221	1,001,198
1999	160	707,963	681,264	408	886,291	846,377	1,124	1,049,796	1,026,747	1,465	1,042,912	1,018,935
2000	157	744,068	698,308	410	930,630	866,718	1,109	1,115,899	1,073,215	1,422	1,129,088	1,081,886
2001	146	800,895	747,968	401	951,666	899,559	1,085	1,155,524	1,134,037	1,426	1,139,834	1,121,118

Table 5. Number and Average Lifetime Costs of Occupational Traumatic Fatal Injury by Age Group and Year, 1992-2001 (2003 Dollars), continued

Year of Death	**45-54 Years**			**55-64 Years**			**65+ Years**		
	Number	Mean Cost	Median Cost	Number	Mean Cost	Median Cost	Number	Mean Cost	Median Cost
All Years	12,410	736,890	696,623	8,099	392,234	373,282	5,196	64,089	52,920
1992	1,130	836,883	784,666	743	434,095	399,773	459	69,975	56,165
1993	1,176	877,787	812,360	787	434,634	407,075	523	67,534	53,942
1994	1,270	872,138	824,998	851	453,826	430,090	528	64,497	50,135
1995	1,218	861,034	822,636	808	459,132	435,405	517	71,438	55,452
1996	1,199	847,319	811,363	837	452,420	428,449	510	71,979	58,165
1997	1,275	856,351	813,486	862	448,673	428,269	526	72,370	56,038
1998	1,238	872,403	820,350	827	465,539	438,142	550	74,302	58,854
1999	1,297	849,845	823,086	804	465,511	453,502	569	73,287	57,613
2000	1,284	902,289	871,958	820	487,320	467,363	491	75,860	64,236
2001	1,323	905,998	873,050	760	488,642	468,691	523	78,736	64,228

Table 6. Number and Total Lifetime Cost of Occupational Traumatic Fatal Injury by Race and Year, 1992-2001 (2003 Dollars)

Year	**All Races**		**White**		**Black**		**Other**	
	Number	Total Cost	Number	Total Cost	Number	Total Cost	Number	Total Cost
All Years	59,017	48,705,018,420	49,230	40,797,583,185	5,926	4,721,298,166	3,861	3,186,137,069
1992	5,833	4,781,514,477	4,891	4,035,093,669	568	436,238,393	374	310,182,415
1993	5,986	4,905,306,114	4,991	4,103,419,014	601	483,060,417	394	318,826,684
1994	6,303	5,169,299,277	5,292	4,368,059,320	633	494,012,184	378	307,227,773
1995	5,959	4,890,676,844	4,920	4,072,860,829	635	493,480,224	404	324,335,792
1996	5,899	4,728,862,237	4,906	3,948,677,656	591	457,081,632	402	323,102,948
1997	6,013	4,851,903,254	4,952	4,016,099,523	640	506,297,374	421	329,506,357
1998	5,840	4,750,777,818	4,893	3,985,519,536	564	451,607,864	383	313,650,418
1999	5,827	4,700,939,270	4,868	3,931,643,086	588	466,745,312	371	302,550,872
2000	5,693	4,936,861,071	4,795	4,184,044,986	556	453,177,960	342	299,638,124
2001	5,664	4,988,878,059	4,722	4,152,165,567	550	479,596,805	392	357,115,687

Table 7. Mean and Median Lifetime Costs of Occupational Traumatic Fatal Injury by Race and Year, 1992-2001 (2003 Dollars)

Year	**All Races**		**White**		**Black**		**Other**	
	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost
All Years	825,271	831,786	828,714	839,012	796,709	804,204	825,210	799,028
1992	819,735	814,340	825,004	821,163	768,025	778,384	829,365	797,803
1993	819,463	828,230	822,164	833,514	803,761	803,532	809,205	774,958
1994	820,133	820,548	825,408	830,610	780,430	784,468	812,772	798,930
1995	820,721	827,215	827,817	834,301	777,134	794,120	802,811	798,258
1996	801,638	812,204	804,867	820,842	773,404	791,640	803,739	756,918
1997	806,902	822,550	811,006	832,458	791,090	805,917	782,675	760,271
1998	813,489	818,178	814,535	824,637	800,723	800,023	818,931	781,711
1999	806,751	830,625	807,651	837,760	793,785	795,463	815,501	814,386
2000	867,181	876,015	872,585	880,541	815,068	854,021	876,135	847,722
2001	880,805	875,898	879,324	876,184	871,994	870,641	911,009	868,789

Table 8. Number and Total Lifetime Cost of Occupational Traumatic Fatal Injury by Industry Division and Year, 1992-2001 (2003 Dollars)

Year	**All Industries**		**Agriculture, Forestry, and Fishing**		**Mining**		**Construction**		**Manufacturing**	
	Number	Cost	Number	Cost	Number	Cost	Number	Cost	Number	Cost
All Years	59,017	48,705,018,420	7,943	4,088,087,169	1,598	1,649,372,072	10,961	9,406,010,029	7,145	5,901,939,421
1992	5,833	4,781,514,477	794	373,537,662	179	185,722,544	941	821,972,084	758	614,813,084
1993	5,986	4,905,306,114	848	406,853,937	174	177,168,982	951	834,861,031	757	633,138,021
1994	6,303	5,169,299,277	842	392,359,558	179	176,678,662	1,053	910,745,883	782	683,446,529
1995	5,959	4,890,676,844	788	397,942,080	157	164,433,212	1,074	943,447,096	711	578,934,873
1996	5,899	4,728,862,237	791	404,441,312	154	159,423,057	1,070	892,742,567	721	585,350,325
1997	6,013	4,851,903,254	820	422,224,253	158	150,991,753	1,106	957,124,706	742	597,287,425
1998	5,840	4,750,777,818	813	431,237,348	147	146,174,504	1,187	954,655,026	695	566,222,384
1999	5,827	4,700,939,270	797	410,789,560	123	114,472,947	1,193	994,557,468	724	596,319,559
2000	5,693	4,936,861,071	711	413,699,092	156	176,735,331	1,152	995,713,153	662	544,927,516
2001	5,664	4,988,878,059	739	435,002,366	171	197,571,081	1,234	1,100,191,015	593	501,499,705

Table 8. Number and Total Lifetime Cost of Occupational Traumatic Fatal Injury by Industry Division and Year, 1992-2001 (2003 Dollars), continued

Year	**Transportation and Public Utility**		**Wholesale Trade**		**Retail Trade**		**Finance, Insurance, and Real Estate**		**Services**		**Public Administration**		**Not Classifiable**	
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
All Years	9,667	8,879,120,144	2,433	1,987,765,159	6,217	4,711,087,752	1,017	882,495,048	8,233	7,317,848,094	3,311	3,520,884,368	492	360,409,165
1992	904	829,921,779	254	203,302,683	678	528,629,834	113	95,425,148	814	735,912,784	336	347,501,283	62	44,775,591
1993	900	828,222,033	248	205,058,655	734	556,084,588	111	91,202,584	843	749,104,542	345	368,347,150	75	55,264,590
1994	965	897,671,735	269	221,798,468	739	556,508,953	111	104,269,834	887	763,108,998	357	366,682,509	119	96,028,150
1995	932	841,008,145	251	194,434,408	636	471,451,755	121	103,632,993	801	692,385,640	429	455,065,591	59	47,941,050
1996	989	873,526,087	266	214,577,808	642	463,541,621	111	97,436,261	827	733,023,710	276	273,643,939	52	31,155,549
1997	1,036	903,284,656	238	194,660,180	648	474,816,168	97	82,397,414	794	689,700,993	345	360,206,345	29	19,209,363
1998	958	857,895,835	226	182,879,489	551	446,640,530	91	77,595,049	812	721,166,685	328	347,621,627	32	18,689,341
1999	1,043	947,293,890	233	188,757,433	496	363,877,269	102	91,212,603	787	667,565,789	295	303,141,068	34	22,951,684
2000	988	958,669,016	230	191,655,789	567	447,121,883	79	58,305,865	828	782,253,917	302	355,972,770	18	11,806,740
2001	952	941,626,968	218	190,640,247	526	402,415,150	81	81,017,298	840	783,625,036	298	342,702,087	12	12,587,106

Table 9. Mean and Median Lifetime Costs of Occupational Traumatic Fatal Injury by Industry Division and Year, 1992-2001 (2003 Dollars)

Year	**All Industries**		**Agriculture, Forestry, and Fishing**		**Mining**		**Construction**		**Manufacturing**		**Transportation and Public Utilities**	
	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost
All Years	825,271	831,786	514,678	589,960	1,032,148	1,060,780	858,134	863,699	826,024	822,143	918,498	936,537
1992	819,735	814,340	470,450	549,238	1,037,556	1,043,206	873,509	885,112	811,099	789,010	918,055	908,015
1993	819,463	828,230	479,781	567,797	1,018,213	1,018,692	877,877	895,400	836,378	827,006	920,247	922,671
1994	820,133	820,548	465,985	540,112	987,032	1,014,677	864,906	862,662	873,973	840,946	930,230	922,277
1995	820,721	827,215	505,003	569,402	1,047,345	1,046,769	878,442	842,149	814,254	825,463	902,369	922,245
1996	801,638	812,204	511,304	583,736	1,035,215	1,073,165	834,339	841,494	811,859	790,018	883,242	910,592
1997	806,902	822,550	514,908	594,866	955,644	1,022,989	865,393	843,514	804,970	802,355	871,896	903,572
1998	813,489	818,178	530,427	589,960	994,384	1,060,913	804,259	811,163	814,708	822,499	895,507	927,396
1999	806,751	830,625	515,420	601,834	930,674	1,001,765	833,661	853,626	823,646	812,175	908,240	944,486
2000	867,181	876,015	581,855	650,766	1,132,919	1,176,612	864,334	895,216	823,153	837,767	970,313	995,980
2001	880,805	875,898	588,636	672,385	1,155,386	1,226,899	891,565	875,898	845,699	850,823	989,104	1,044,869

Table 9. Mean and Median Lifetime Costs of Occupational Traumatic Fatal Injury by Industry Division and Year, 1992-2001 (2003 Dollars), continued

Year	**Wholesale Trade**		**Retail Trade**		**Fire, Insurance, and Real Estate**		**Services**		**Public Administration**		**Not Classified**	
	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost
All Years	817,002	847,557	757,775	769,870	867,743	903,706	888,843	858,516	1,063,390	1,145,823	732,539	764,917
1992	800,404	813,254	779,690	771,925	844,470	855,305	904,070	842,732	1,034,230	1,110,058	722,187	832,096
1993	826,849	872,866	757,608	758,511	821,645	821,474	888,617	856,677	1,067,673	1,165,245	736,861	921,937
1994	824,530	860,396	753,057	765,866	939,368	993,394	860,326	805,245	1,027,122	1,122,671	806,959	868,331
1995	774,639	821,029	741,276	755,609	856,471	862,956	864,402	817,727	1,060,759	1,134,622	812,560	831,335
1996	806,683	837,819	722,027	720,855	877,804	973,524	886,365	848,888	991,464	1,062,545	599,145	643,296
1997	817,900	850,111	732,741	749,409	849,458	914,427	868,641	840,887	1,044,076	1,120,611	662,392	677,183
1998	809,201	827,366	810,600	824,095	852,693	899,282	888,136	861,748	1,059,822	1,164,424	584,042	611,910
1999	810,118	847,425	733,624	768,230	894,241	992,289	848,241	858,516	1,027,597	1,112,607	675,050	706,026
2000	833,286	870,947	788,575	810,851	738,049	778,865	944,751	932,226	1,178,718	1,276,341	655,930	736,375
2001	874,497	949,795	765,048	789,448	1,000,214	1,033,818	932,887	913,568	1,150,007	1,258,290	1,048,926	1,190,038

Table 10. Number and Total Lifetime Cost of Occupational Traumatic Fatal Injury by Occupation Division and Year, 1992-2001 (2003 Dollars)

Year	**All Occupations**		**Mgr & Prof Speciality**		**Technical, Sales, and Admin Support**		**Ser vice**		**Farming, Forestry,and Fishing**		**Precision Production, Craft & Repair**		**Operators, Fabricators, and Laborers**		**Unknown**	
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No	Cost	No.	Cost	No.	Cost	No.	Cost
All	59,017	48,705,018,420	6,626	7,488,489,046	7,288	6,765,178,180	4,844	3,983,548,786	8,806	4,292,762,618	10,793	10,082,857,256	20,206	15,809,670,247	454	282,512,288
1992	5,833	4,781,514,477	680	770,690,609	804	748,889,911	517	404,461,824	916	423,940,111	1,055	997,826,741	1,836	1,418,187,414	25	17,517,867
1993	5,986	4,905,306,114	669	754,050,588	790	734,260,433	526	425,106,352	951	441,402,877	1,087	1,006,589,252	1,895	1,492,965,719	68	50,930,893
1994	6,303	5,169,299,277	753	873,400,967	896	826,579,377	566	452,257,187	933	418,675,308	1,079	1,008,573,942	2,006	1,537,141,885	70	52,670,610
1995	5,959	4,890,676,844	693	778,854,403	782	698,091,175	516	417,199,659	853	408,848,171	1,035	988,679,991	2,017	1,553,636,875	63	45,366,571
1996	5,899	4,728,862,237	705	773,583,747	742	669,006,238	474	351,477,301	871	424,101,243	1,062	970,930,959	1,984	1,511,003,841	61	28,758,908
1997	6,013	4,851,903,254	657	718,972,723	725	640,270,139	479	392,362,814	908	440,029,654	1,069	997,129,518	2,123	1,637,403,763	52	25,734,644
1998	5,840	4,750,777,818	635	706,079,071	658	646,010,751	421	363,759,519	903	443,763,116	1,074	948,128,025	2,119	1,629,330,449	30	13,706,887
1999	5,827	4,700,939,270	589	655,681,168	596	541,747,871	449	358,645,138	884	439,135,147	1,120	1,006,675,368	2,155	1,683,280,760	34	15,773,818
2000	5,693	4,936,861,071	628	731,572,143	666	662,958,850	415	385,098,151	793	419,123,081	1,085	1,031,423,629	2,066	1,684,673,055	40	22,012,161
2001	5,664	4,988,878,059	617	725,603,626	629	597,363,433	481	433,180,840	794	433,743,910	1,127	1,126,899,833	2,005	1,662,046,487	11	10,039,929

Table 11. Mean and Median Lifetime Costs of Occupational Traumatic Fatal Injury by Occupation Division and Year, 1992-2001 (2003 Dollars)

Year	**All Occupations**		**Mgr & Prof Speciality**		**Technical, Sales, and Admin Support**		**Ser vice**		**Farming, Forestry, and Fishing**		**Precision Production, Craft & Repair**		**Operators, Fabricators, and Laborers**		**Unknown**	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All	825,271	831,786	1,130,167	1,211,026	928,263	915,794	822,368	780,215	487,482	589,960	934,203	986,013	782,425	821,981	622,274	665,870
1992	819,735	814,340	1,133,369	1,177,334	931,455	960,496	782,325	758,296	462,817	565,371	945,807	977,489	772,433	812,167	700,715	915,500
1993	819,463	828,230	1,127,131	1,213,921	929,444	905,080	808,187	775,765	464,146	582,326	926,025	974,036	787,845	833,996	748,984	922,479
1994	820,133	820,548	1,159,895	1,250,627	922,522	895,550	799,041	759,876	448,741	556,694	934,730	960,378	766,272	804,970	752,437	890,988
1995	820,721	827,215	1,123,888	1,178,025	892,700	876,905	808,526	768,041	479,306	572,037	955,246	998,460	770,271	809,547	720,104	874,267
1996	801,638	812,204	1,097,282	1,187,350	901,626	906,947	741,513	723,185	486,913	593,514	914,248	988,202	761,595	810,547	471,458	565,096
1997	806,902	822,550	1,094,327	1,177,698	883,131	886,820	819,129	774,598	484,614	588,320	932,768	992,612	771,269	812,911	494,897	589,223
1998	813,489	818,178	1,111,936	1,219,613	981,779	959,553	864,037	805,928	491,432	581,965	882,801	942,675	768,915	803,689	456,896	543,803
1999	806,751	830,625	1,113,211	1,182,663	908,973	896,019	798,764	767,913	496,759	601,834	898,817	984,110	781,105	828,467	463,936	586,115
2000	867,181	876,015	1,164,924	1,253,247	995,434	931,177	927,947	847,809	528,528	625,602	950,621	1,005,727	815,427	864,787	550,304	624,517
2001	880,805	875,898	1,176,019	1,252,022	949,703	909,427	900,584	846,294	546,277	652,585	999,911	1,049,440	828,951	857,896	912,721	1,085,988

Table 12 Number and Total Lifetime Cost of Occupational Traumatic Fatal Injury by Nature of Injury and Year, 1992-2001 (2003 Dollars)

Year	All Natures of Injury		Traumatic Injuries and Disorders		Systemic Diseases and Disorders		Infectious and Parasitic Diseases		Other Natures		Nonclassifiable	
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
All Years	59,017	48,705,018,420	58,772	48,529,828,702	154	106,506,721	16	12,402,404	6	5,368,068	69	50,912,525
1992	5,833	4,781,514,477	5,731	4,708,808,383	72	48,165,048	(1)	(1)	(1)	(1)	24	18,806,923
1993	5,986	4,905,306,114	5,940	4,875,581,496	34	21,713,817	(1)	(1)	(1)	(1)	8	5,264,716
1994	6,303	5,169,299,277	6,287	5,158,286,570	10	6,993,403	(1)	(1)	(1)	(1)	(1)	(1)
1995	5,959	4,890,676,844	5,937	4,872,975,483	10	8,300,296	(1)	(1)	(1)	(1)	11	8,438,414
1996	5,899	4,728,862,237	5,887	4,719,763,431	(1)	(1)	(1)	(1)	(1)	(1)	5	5,040,817
1997	6,013	4,851,903,254	6,001	4,843,019,195	(1)	(1)	(1)	(1)	(1)	(1)	8	4,524,295
1998	5,840	4,750,777,818	5,830	4,742,246,948	8	6,504,583	(1)	(1)	(1)	(1)	(1)	(1)
1999	5,827	4,700,939,270	5,819	4,696,249,717	(1)	(1)	(1)	(1)	(1)	(1)	7	4,560,027
2000	5,693	4,936,861,071	5,679	4,926,847,472	12	8,128,722	(1)	(1)	(1)	(1)	(1)	(1)
2001	5,664	4,988,878,059	5,661	4,986,050,006	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

(1) Does not meet publication criteria.

Table 13. Mean and Median Lifetime Costs of Occupational Traumatic Fatal Injury by Nature of Injury and Year, 1992-2001 (2003 Dollars)

Year	All Natures of Injury		Traumatic Injuries and Disorders		Systemic Diseases and Disorders		Infectious and Parasitic Diseases		Other Natures		Nonclassifiable	
	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost
All Years	825,271	831,786	825,730	832,091	691,602	677,061	775,150	869,365	976,018	1,118,134	737,863	790,668
1992	819,735	814,340	821,638	815,186	668,959	639,727	(1)	(1)	(1)	(1)	783,622	936,474
1993	819,463	828,230	820,805	828,852	638,642	617,949	(1)	(1)	(1)	(1)	658,089	648,647
1994	820,133	820,548	820,469	820,548	699,340	593,433	(1)	(1)	(1)	(1)	(1)	(1)
1995	820,721	827,215	820,781	826,793	830,030	908,969	(1)	(1)	(1)	(1)	767,129	872,874
1996	801,638	812,204	801,726	811,892	(1)	(1)	(1)	(1)	(1)	(1)	1,008,163	943,604
1997	806,902	822,550	807,035	822,550	(1)	(1)	(1)	(1)	(1)	(1)	565,537	390,862
1998	813,489	818,178	813,421	818,178	813,073	734,245	(1)	(1)	(1)	(1)	(1)	(1)
999	806,751	830,625	807,054	831,421	(1)	(1)	(1)	(1)	(1)	(1)	651,432	707,851
2000	867,181	876,015	867,555	876,363	677,393	753,994	(1)	(1)	(1)	(1)	(1)	(1)
2001	880,805	875,898	880,772	875,898	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)

(1) Does not meet publication criteria.

Table 14. Number and Total Lifetime Cost of Occupational Traumatic Fatal Injury by Source of Injury and Year, 1992-2001 (2003 Dollars)

Year	**All Sources of Injury**		**Chemicals and Chemical Products**		**Containers**		**Furniture and Fixtures**		**Machinery**		**Parts and Materials**	
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
All Years	59,017	48,705,018,420	1,449	1,345,460,506	827	641,425,789	179	143,543,411	4,883	3,670,201,619	4,096	3,697,458,482
1992	5,833	4,781,514,477	174	161,299,559	77	60,842,316	21	18,348,009	579	429,529,175	391	348,485,392
1993	5,986	4,905,306,114	157	141,021,823	77	59,537,422	12	10,509,562	486	342,361,925	450	406,543,953
1994	6,303	5,169,299,277	174	157,627,498	82	63,916,882	22	14,787,280	487	354,507,929	432	377,699,559
1995	5,959	4,890,676,844	135	121,236,631	86	61,815,735	14	11,265,107	462	341,846,338	454	419,139,978
1996	5,899	4,728,862,237	139	129,068,749	93	66,343,439	16	16,308,378	450	336,770,776	401	364,707,955
1997	6,013	4,851,903,254	148	137,273,140	94	72,359,407	16	12,209,994	540	402,920,699	388	338,456,396
1998	5,840	4,750,777,818	130	121,718,379	82	62,546,551	18	14,232,371	471	341,505,739	396	349,089,795
1999	5,827	4,700,939,270	155	146,758,226	71	49,878,605	19	13,701,940	482	365,751,448	386	339,727,907
2000	5,693	4,936,861,071	117	113,405,086	83	73,090,467	16	13,300,325	476	388,885,210	394	362,227,132
2001	5,664	4,988,878,059	120	116,051,416	82	71,094,965	25	18,880,445	450	366,122,380	404	391,380,415

Table 14. Number and Total Lifetime Cost of Occupational Traumatic Fatal Injury by Source of Injury and Year, 1992-2001 (2003 Dollars), continued

Year	Persons, Plants Animals, and Minerals		Structures and Surfaces		Tools, Instruments, and Equipment		Vehicles		Other Sources		Nonclassifiable	
	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
All Years	3,031	2,017,905,338	7,349	5,646,321,743	1,278	1,008,426,832	25,227	21,399,117,094	10,299	8,851,693,514	399	283,464,091
1992	368	249,309,634	582	450,621,939	142	106,696,113	2,308	1,953,486,285	1,118	947,730,049	73	55,166,007
1993	349	230,122,029	642	503,773,177	125	91,388,353	2,452	2,073,588,693	1,177	1,008,424,263	59	38,034,915
1994	303	214,223,790	694	528,461,239	132	98,267,002	2,684	2,272,864,398	1,237	1,045,057,689	56	41,886,011
1995	281	196,992,781	684	527,103,044	130	103,972,836	2,479	2,053,517,754	1,197	1,024,506,285	37	29,280,354
1996	317	194,002,373	750	553,490,497	130	103,760,974	2,513	2,091,383,532	1,052	849,524,658	38	23,500,904
1997	303	204,976,788	775	591,687,221	136	106,037,554	2,550	2,098,874,891	1,027	864,294,595	36	22,812,569
1998	260	167,885,906	766	569,072,386	122	99,671,397	2,613	2,167,902,807	950	833,563,802	32	23,588,685
1999	304	192,711,082	766	582,968,503	123	92,777,821	2,618	2,154,354,644	872	742,075,304	31	20,233,792
2000	288	184,937,172	804	631,150,660	123	104,684,015	2,540	2,295,257,827	829	753,363,516	23	16,559,660
2001	258	182,743,782	886	707,993,077	115	101,170,768	2,470	2,237,886,264	840	783,153,353	14	12,401,194

Table 15. Mean and Median Lifetime Costs of Occupational Traumatic Fatal Injury by Source of Injury and Year, 1992-2001 (2003 Dollars)

Year	**All Sources of Injury**		**Chemicals and Chemical Products**		**Containers**		**Furniture and Fixtures**		**Machinery**		**Parts and Materials**	
	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost
All Years	825,271	831,786	928,544	926,923	775,606	814,598	801,918	809,530	751,628	786,465	902,700	914,071
1992	819,735	814,340	927,009	915,183	790,160	843,342	873,715	1,025,766	741,847	759,284	891,267	913,281
1993	819,463	828,230	898,228	889,446	773,213	833,771	875,797	741,680	704,448	739,955	903,431	897,005
1994	820,133	820,548	905,905	915,424	779,474	809,457	672,149	682,674	727,942	755,068	874,305	889,593
1995	820,721	827,215	898,049	877,965	718,788	776,053	804,651	864,514	739,927	771,135	923,216	924,108
1996	801,638	812,204	928,552	932,482	713,370	775,930	1,019,274	1,096,988	748,380	776,793	909,496	930,337
1997	806,902	822,550	927,521	928,745	769,781	808,707	763,125	788,866	746,149	778,528	872,310	910,560
1998	813,489	818,178	936,295	929,969	762,763	776,362	790,687	792,751	725,065	774,944	881,540	897,547
1999	806,751	830,625	946,827	936,237	702,516	825,533	721,155	739,948	758,820	813,470	880,124	880,601
2000	867,181	876,015	969,274	994,810	880,608	844,729	831,270	842,668	816,986	858,388	919,358	925,293
2001	880,805	875,898	967,095	994,043	867,012	850,549	755,218	795,648	813,605	837,133	968,763	973,360

Table 15. Mean and Median Lifetime Costs of Occupational Traumatic Fatal Injury by Source of Injury and Year, 1992-2001 (2003 Dollars), continued

Year	Persons, Plants Animals, and Minerals		Structures and Surfaces		Tools, Instruments, and Equipment		Vehicles		Other Sources		Nonclassifiable	
	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost
All Years	665,756	701,208	768,312	805,999	789,066	795,385	848,262	867,574	859,471	834,436	711,428	746,785
1992	677,472	693,945	774,265	823,818	751,381	737,451	846,398	850,846	847,701	809,620	755,699	774,626
1993	659,375	707,873	784,693	818,696	731,107	719,698	845,672	871,221	856,775	843,432	650,330	699,765
1994	707,009	756,779	761,472	794,940	744,447	770,826	846,820	853,709	844,832	818,416	747,964	886,851
1995	701,042	750,257	770,618	802,019	799,791	830,723	828,365	843,153	855,895	826,563	791,361	780,287
1996	611,995	661,928	737,987	779,443	798,161	794,178	832,226	848,888	807,533	790,940	618,445	642,899
1997	676,491	699,394	763,467	804,848	779,688	777,995	823,088	855,519	841,572	816,352	633,682	721,265
1998	645,715	682,761	742,914	774,498	816,979	845,384	829,660	849,809	877,436	847,831	737,146	740,623
1999	633,918	679,941	761,055	806,500	754,291	796,490	822,901	857,988	851,004	846,358	652,703	680,857
2000	642,143	694,861	785,013	837,703	851,090	877,069	903,645	932,527	908,762	880,487	719,985	801,261
2001	708,309	719,817	799,089	841,614	879,746	873,375	906,027	918,921	932,325	917,803	885,800	826,310

Table 16. Number and Total Lifetime Cost of Occupational Traumatic Fatal Injury by Event or Exposure and Year, 1992-2001 (2003 Dollars)

Year	All Events or Exposures		Contact with objects and equipment		Falls		Bodily reaction and exertion		Exposure to harmful substances or environments	
	Number	Cost	Number	Cost	Number	Cost	Number	Cost	Number	Cost
All Years	59,017	48,705,018,420	9,722	7,308,908,141	6,668	5,009,166,165	172	133,637,260	5,465	4,916,948,788
1992	5,833	4,781,514,477	968	730,263,435	575	434,102,541	57	38,966,815	586	529,745,196
1993	5,986	4,905,306,114	1,016	746,283,350	596	453,103,004	29	21,276,784	577	512,155,326
1994	6,303	5,169,299,277	995	731,677,430	642	476,144,485	10	8,384,164	622	539,305,739
1995	5,959	4,890,676,844	888	674,623,778	632	482,588,707	11	9,943,267	589	531,099,631
1996	5,899	4,728,862,237	984	718,479,412	661	475,750,665	11	7,897,493	517	464,242,524
1997	6,013	4,851,903,254	1,019	760,337,772	685	513,536,224	8	7,152,315	539	483,167,712
1998	5,840	4,750,777,818	921	666,022,180	684	490,461,929	8	6,519,596	562	497,094,017
1999	5,827	4,700,939,270	1,011	756,497,299	691	517,690,002	11	9,935,978	513	447,643,340
2000	5,693	4,936,861,071	987	768,371,576	711	550,481,782	12	11,382,352	472	442,227,823
2001	5,664	4,988,878,059	933	756,351,910	791	615,306,826	15	12,178,496	488	470,267,479

Table 16. Number and Total Lifetime Cost of Occupational Traumatic Fatal Injury by Event or Exposure and Year, 1992-2001 (2003 Dollars), continued

Year	Transportation accidents		Fires and explosions		Assaults and violent acts		Other and Nonclassifiable	
	Number	Cost	Number	Cost	Number	Cost	Number	Cost
All Years	24,772	20,957,186,434	1,883	1,675,980,636	10,229	8,625,446,894	104	76,374,920
1992	2,326	1,955,511,893	162	147,935,842	1,143	934,268,744	16	10,720,011
1993	2,397	2,025,558,612	194	171,134,232	1,163	964,564,133	13	10,914,879
1994	2,646	2,241,438,033	193	180,891,985	1,185	984,659,272	9	5,744,781
1995	2,464	2,028,178,837	203	172,052,756	1,161	982,305,217	11	9,884,651
1996	2,477	2,065,521,635	177	150,636,281	1,067	841,798,688	5	4,535,538
1997	2,512	2,050,841,915	193	167,104,842	1,045	861,378,846	12	8,383,629
1998	2,550	2,111,326,029	197	174,889,261	910	797,648,500	8	6,816,307
1999	2,535	2,077,643,573	211	187,988,014	840	695,487,357	15	8,053,707
2000	2,476	2,238,631,661	170	150,161,385	859	772,343,560	6	3,260,930
2001	2,389	2,162,534,245	183	173,186,038	856	790,992,578	9	8,060,487

Table 17. Mean and Median Lifetime Costs of Occupational Traumatic Fatal Injury by Event or Exposure and Year, 1992-2001 (2003 Dollars)

Year	**All Events or Exposures**		**Contact with objects and equipment**		**Falls**		**Bodily reaction and exertion**		**Exposure to harmful substances or environments**	
	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost
All Years	825,271	831,786	751,791	781,868	751,225	795,854	776,961	816,969	899,716	893,957
1992	819,735	814,340	754,404	757,520	754,961	808,443	683,628	664,633	904,002	895,158
1993	819,463	828,230	734,531	786,283	760,240	803,963	733,682	848,739	887,618	873,163
1994	820,133	820,548	735,354	770,008	741,658	785,815	838,416	876,317	867,051	863,954
1995	820,721	827,215	759,711	792,501	763,590	803,882	903,933	856,954	901,697	887,661
1996	801,638	812,204	730,162	745,721	719,744	765,198	717,954	806,967	897,955	881,576
1997	806,902	822,550	746,161	782,484	749,688	783,531	894,039	873,492	896,415	889,437
1998	813,489	818,178	723,151	759,697	717,050	761,442	814,949	766,305	884,509	895,242
1999	806,751	830,625	748,266	785,240	749,190	802,724	903,271	934,176	872,599	865,076
2000	867,181	876,015	778,492	812,387	774,236	816,565	948,529	843,632	936,923	947,853
2001	880,805	875,898	810,667	827,062	777,885	824,881	811,900	834,128	963,663	962,549

Table 17. Mean and Median Lifetime Costs of Occupational Traumatic Fatal Injury by Event or Exposure and Year, 1992-2001 (2003 Dollars), continued

Year	**Transportation accidents**		**Fires and explosions**		**Assaults and violent acts**		**Other and Nonclassifiable**	
	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost	Mean Cost	Median Cost
All Years	846,003	861,299	890,059	923,336	843,235	822,280	734,374	729,533
1992	840,719	842,720	913,184	955,176	817,383	786,727	670,001	630,503
1993	845,039	866,922	882,135	933,146	829,376	807,077	839,606	749,517
1994	847,104	850,540	937,264	975,765	830,936	813,410	638,309	729,303
1995	823,125	839,252	847,551	870,687	846,085	826,563	898,605	1,009,565
1996	833,880	845,542	851,052	893,589	788,940	774,171	907,108	886,265
1997	816,418	845,708	865,828	914,125	824,286	801,998	698,636	921,863
1998	827,971	841,218	887,763	881,850	876,537	854,722	852,038	732,629
1999	819,583	850,090	890,938	943,424	827,961	826,767	536,914	596,581
2000	904,132	924,529	883,302	890,509	899,119	877,069	543,488	477,921
2001	905,205	915,275	946,372	977,567	924,057	911,134	895,610	872,908

Table 18. Number and Lifetime Costs of Occupational Traumatic Fatal Injury by Location at the Time of Death, 1992-2001 (2003 Dollars)

Location at Time of Death	Fatalities	Mean Cost	Median Cost	Total Cost
10 Home	232	801,876	819,649	186,035,333
11 Home, unspecified	1,077	782,702	795,827	842,969,529
12 Apartment	357	856,410	837,067	305,738,428
13 Farm house	61	574,570	524,880	35,048,745
14 Residential construction site (added 1998)	459	821,197	858,185	376,929,635
19 Home, NEC	759	823,235	817,545	624,835,216
20 Farm	527	428,321	447,734	225,725,029
21 Farm, unspecified	1,544	446,485	415,041	689,373,599
22 Farm buildings	461	520,258	611,138	239,838,938
23 Farm land under cultivation, fields, meadows	2,197	595,374	579,604	1,308,036,459
24 Farm pond, creek, canal, irrigation ditch	176	535,632	592,016	94,271,230
25 Manure pit	25	678,182	710,922	16,954,556
26 Silo, grain bin (added 1995)	218	636,787	687,887	138,819,613
29 Farm, NEC	630	521,635	551,824	328,629,929
30 Mine and quarry	83	993,589	1,056,473	82,467,908
31 Mine and quarry, unspecified	98	910,807	979,004	89,259,039
32 Gravel, sand pit	119	874,865	885,230	104,108,987
33 Mine tunnel under construction	15	1,049,924	1,034,745	15,748,867
34 Mine	371	1,070,965	1,106,921	397,327,883
39 Mine and quarry, NEC	136	919,362	968,218	125,033,272
40 Industrial place and premises	1,228	860,745	872,288	1,056,995,128
41 Industrial place and premises, unspecified	1,040	845,555	854,735	879,376,954
42 Dockyard	338	849,709	846,602	287,201,667
43 Industrial yard	735	814,262	839,048	598,482,489
44 Loading platform	435	775,235	799,751	337,227,429
45 Railway yard, line, or tracks	576	929,224	936,342	535,232,789
46 Warehouse (except loading platform)	649	819,643	815,013	531,948,162
47 Construction site (includes major renovations)	4,216	857,377	856,661	3,614,701,132
48 Factory, plant (added 1996)	2,037	859,056	855,394	1,749,896,784
49 Industrial place, repair shops or premises, NEC	2,692	865,990	868,320	2,331,245,544
50 Place for recreation and sport	73	799,644	767,584	58,374,008
51 Place for recreation and sport, unspecified	58	839,585	760,929	48,695,902
52 Amusement park	56	824,470	804,349	46,170,338
53 Recreation, sports center on employer's premises	121	870,460	823,484	105,325,654
59 Recreation and sports areas, NEC	451	894,337	883,595	403,346,074
60 Street and highway	3,151	849,461	880,934	2,676,651,718

Table 18. Number and Lifetime Costs of Occupational Traumatic Fatal Injury by Location at the Time of Death, 1992-2001 (2003 Dollars), continued

Location at Time of Death	Fatalities	Mean Cost	Median Cost	Total Cost
61 Street and highway , unspecified (added 1994)	1,256	836,310	858,733	1,050,405,479
62 Interstate, freeway, or expressway (added 1994)	3,359	881,834	937,432	2,962,081,748
63 Other state or U.S. highway (added 1994)	4,670	858,282	914,373	4,008,177,155
64 Local road or street (added 1994)	4,448	840,497	857,896	3,738,531,843
65 Road construction (added 1995)	426	817,313	821,878	348,175,142
69 Street, highway, road, NEC	566	860,341	898,631	486,952,895
70 Public building	761	821,452	785,139	625,125,285
71 Public building, unspecified	249	817,902	843,136	203,657,523
72 Bank	98	847,593	848,855	83,064,133
73 Hotel, motel	290	796,335	802,709	230,937,267
74 Convenience store (added 1996—prior to 1996 included any type of grocery or market)	1,202	730,302	703,069	877,823,172
75 Office building	973	987,495	1,002,772	960,833,027
76 Restaurant, café	874	763,218	759,898	667,052,291
77 Other commercial store (added 1996—beginning 1996 included grocery stores, except convenience stores	1,871	770,926	780,919	1,442,402,423
78 School	343	841,121	833,235	288,504,528
79 Public building, NEC	1,071	831,049	818,372	890,053,618
80 Residential institution	34	975,018	845,845	33,150,620
81 Residential institution, unspecified	13	1,021,462	933,268	13,279,004
82 Prison, jail, detention home	71	946,919	992,602	67,231,277
89 Residential institution, NEC	122	828,465	825,440	101,072,708
90 Other places	775	944,428	858,641	731,931,484
91 Other places, unspecified	249	917,352	848,829	228,420,771
92 Parking lot, garage (employer's premises)	1,165	817,424	821,300	952,298,626
93 Parking lot, garage (except employer's premises)	610	862,047	893,720	525,848,417
94 River, lake, pond, stream	597	976,092	956,044	582,727,074
95 Sea	913	856,328	726,594	781,827,215
98 Places, NEC	3,060	1,001,458	911,482	3,064,460,587
99 Not reported	1,087	820,592	798,894	891,983,639

Note: Not all fatalities (463) were classified with valid codes, therefore, the sum of the individual entries will not equal the total number of fatalities experienced in the 10 year period.

Table 19. Number and Lifetime Costs of Occupational Traumatic Fatal Injury by Activity at the Time of Death, 1992-2001 (2003 Dollars)

Activity at Time of Death	Fatalities	Mean Cost	Median Cost	Total Cost
100 Veh/&/trans/operatio	143	803,864	829,493	114,952,569
110 Driving,operating	568	841,921	867,983	478,211,004
111 Driving,automobile	3,720	917,269	919,155	3,412,241,077
112 Driving,airplane	1,305	1,436,768	1,575,927	1,874,982,217
113 Driving,truck	7,681	842,073	926,889	6,467,963,744
114 Driving,indust/const/veh	1,023	756,825	792,019	774,231,747
115 Driving,boat	246	749,395	707,347	184,351,143
116 Driving,train	60	1,111,085	1,237,450	66,665,095
117 Driving,bus	91	655,649	754,727	59,664,102
118 Driving,bicycle,motorcycle	210	1,061,426	1,100,949	222,899,435
119 Driving,NEC	816	785,092	809,065	640,634,738
120 Riding,in,on	66	798,494	741,666	52,700,600
121 Riding,automobile	403	913,096	931,884	367,977,645
122 Riding,airplane	974	1,234,435	1,280,734	1,202,339,360
123 Riding,trucks	1,050	815,167	807,115	855,924,983
124 Riding,indust/const/veh	161	836,098	838,968	134,611,790
125 Riding,boat	689	856,712	730,778	590,274,856
126 Riding,train	72	1,022,742	1,084,590	73,637,433
127 Riding,bus	19	781,209	757,905	14,842,964
128 Riding,horse	109	700,556	670,052	76,360,650
129 Riding,nec	261	836,430	801,327	218,308,118
130 Boarding,alighting	11	882,355	768,664	9,705,903
131 Boarding,automobile	53	849,385	806,921	45,017,391
132 Boarding,truck	203	759,269	787,373	154,131,634
133 Boarding,indust/const/veh	69	708,124	766,416	48,860,559
134 Boarding,boat	24	719,243	741,195	17,261,830
135 Boarding,bus	7	517,805	441,483	3,624,632
137 Boarding,other/public/veh(pla	21	984,279	1,081,949	20,669,852
139 Boarding,nec	31	662,341	633,504	20,532,556
140 resurfacing,blacktop	87	768,912	802,970	66,895,357
150 directing,flagging t	337	729,536	763,059	245,853,524
160 walking/in/or/near/r	133	815,252	832,659	108,428,462
161 crossing street	228	711,514	740,821	162,225,171
162 walking behind vehic	309	720,031	777,084	222,489,634
169 walking/in/or/near/r	339	858,442	854,356	291,011,988
190 veh/&/trans/operatio	52	720,315	729,037	37,456,360
191 driving,operating fa	1,730	385,453	332,273	666,832,880
192 Riding,in,on farm ve	102	420,291	517,301	42,869,686

Table 19. Number and Lifetime Costs of Occupational Traumatic Fatal Injury by Activity at the Time of Death, 1992-2001 (2003 Dollars), continued

Activity at Time of Death	Fatalities	Mean Cost	Median Cost	Total Cost
193 Boarding,alighting f	66	285,839	64,236	18,865,394
194 veh/&/trans/operatio	172	703,974	791,640	121,083,512
200 Using/or/operating t	86	767,196	814,664	65,978,846
210 Operating heavy equi	72	907,686	914,137	65,353,377
211 Operatinghydraulic equipment	96	817,739	837,353	78,502,952
212 Operatingcrane	190	880,927	915,677	167,376,196
213 Operatingfarm machinery	721	425,823	430,237	307,018,625
214 Operatingmine machinery	199	1,089,490	1,164,485	216,808,447
215 Operatingearth moving machine	293	750,608	816,887	219,928,202
216 Operatingmaterials handling m	243	801,645	816,776	194,799,696
219 Operating heavy equi	249	829,951	883,095	206,657,849
220 Operating machinery	121	754,896	814,676	91,342,384
221 Operatinggrinding,buffinf,gla	48	714,616	822,592	34,301,548
222 Operatingcutting	143	703,785	744,025	100,641,221
223 Operatingtool & die	28	877,428	866,257	24,567,992
229 Operating machinery,	437	801,384	813,620	350,204,907
230 Using,power tools	17	764,000	823,463	12,988,007
231 Using,drill	47	898,313	886,611	42,220,719
232 Using,power saw(band saw,c	186	652,695	704,677	121,401,213
233 Using,lawnmower	35	565,973	642,972	19,809,053
234 Using,air hammer	9	895,481	856,406	8,059,326
239 Using,nec	89	790,688	771,960	70,371,192
240 Using nonpowered hand	10	645,091	694,070	6,450,912
241 Using,wrench,hammer,screwdr	43	871,481	958,807	37,473,670
242 Using,knife/saw	18	639,232	638,803	11,506,169
244 Shoveling	83	774,627	804,487	64,294,007
245 Using,farm tools(mach/pitch	14	651,698	650,961	9,123,767
249 Using,nec	58	751,662	802,489	43,596,396
250 Oper/or/reading/gaug	33	1,065,781	1,075,476	35,170,773
251 Turning on/off	40	829,630	880,329	33,185,212
252 Plugging/unplugging/	43	945,854	974,738	40,671,706
253 Adjusting gauges	28	976,640	1,016,229	27,345,911
254 Reading gauges	19	912,112	951,841	17,330,122
259 Operating or reading gauges,...nec	43	1,051,242	1,026,395	45,203,406
260 Welding,cutting,brazing	432	881,881	957,324	380,972,516
270 Logging,trimming,pru	157	628,660	705,818	98,699,646
271 Logging	767	615,565	689,628	472,138,228

Table 19. Number and Lifetime Costs of Occupational Traumatic Fatal Injury by Activity at the Time of Death, 1992-2001 (2003 Dollars), continued

Activity at Time of Death	Fatalities	Mean Cost	Median Cost	Total Cost
272 Trimming,pruning,nec	498	681,362	703,445	339,318,323
273 Operating wood chipp	30	707,032	688,432	21,210,966
279 Logging or oper.tools,mach., NEC	74	674,632	712,371	49,922,770
290 Using/operating/tool	41	719,241	771,880	29,488,868
299 Using or oper.tools,mach, NEC	45	844,007	906,850	37,980,307
300 Constructing,repairi	511	799,295	824,226	408,439,761
310 Const/assembling,dis	526	828,535	834,247	435,809,182
311 Const/assembling	1,145	871,477	875,644	997,840,906
312 Installing	1,596	929,517	942,494	1,483,508,383
313 Dismantling,remov	712	849,211	844,925	604,638,117
314 Planting(landsca	20	693,816	718,509	13,876,311
319 Construction, NEC	479	858,972	841,226	411,447,532
320 Repair, maintenance	681	842,700	913,073	573,878,648
321 Repairing	2,066	835,650	897,055	1,726,452,296
322 Maintenance	631	850,856	882,771	536,890,417
323 Adjusting	134	882,145	903,575	118,207,410
324 Unjamming	230	754,122	765,957	173,448,121
329 Repair, maintenance	301	857,292	918,979	258,044,874
330 Inspecting or che	638	929,554	948,526	593,055,374
340 Cleaning, washing	177	711,853	743,210	125,997,983
341 Cleaning up spill	6	823,514	854,874	4,941,082
342 Sweeping, mopping	75	651,391	717,730	48,854,333
343 Cleaning vat,tank	143	848,205	802,724	121,293,356
344 Cleaning machines	166	768,176	787,980	127,517,292
345 Cleaning, parts, tools	20	897,100	885,256	17,942,001
349 Cleaning, washing,n	330	721,135	735,683	237,974,629
350 Clearing, spraying	9	746,003	721,065	6,714,023
351 Brush,trees	118	623,847	707,436	73,613,996
352 Spraying pesticides, etc.	14	632,055	711,487	8,848,766
359 Clearing, spraying, NEC	31	689,186	725,400	21,364,767
360 Painting, etc.	83	663,417	818,115	55,063,622
361 Applying/paint/fin	12	882,134	884,228	10,585,602
362 Painting,not/in a	233	708,194	795,827	165,009,168
363 Applying other/fin	38	858,329	836,315	32,616,502
369 Painting, NEC	66	788,232	824,609	52,023,339
390 Const/repairing,cl	124	868,419	894,841	107,683,998

Table 19. Number and Lifetime Costs of Occupational Traumatic Fatal Injury by Activity at the Time of Death, 1992-2001 (2003 Dollars), continued

Activity at Time of Death	Fatalities	Mean Cost	Median Cost	Total Cost
400 Protective service	375	852,738	804,301	319,776,828
410 Fighting a fire	233	1,113,667	1,202,067	259,484,491
420 Tending to a hazar	16	905,716	974,825	14,491,462
430 Apprehending,break	342	1,109,927	1,203,846	379,595,088
440 Rescuing,or evacua	118	1,001,260	1,024,384	118,148,713
490 Protective service	554	933,912	917,291	517,387,275
500 Materials handling operations	269	760,247	790,452	204,506,505
510 Lifting materials	97	749,808	780,402	72,731,358
520 Carrying materials	137	779,027	798,413	106,726,711
530 Holding materials	81	847,603	824,290	68,655,804
540 Loading, unloading (packing,..	1,072	747,986	787,859	801,840,960
550 Working with chemicals	51	933,544	927,449	47,610,750
551 Mixing chemicals	39	1,010,367	947,076	39,404,331
553 Pouring chemicals	36	836,779	831,727	30,124,034
559 Working with chemicals, NEC	71	933,347	932,828	66,267,639
560 Retrieving objects	135	807,817	794,755	109,055,342
590 Materials handling	79	792,249	789,646	62,587,660
591 Throwing, catching	17	759,627	768,135	12,913,651
592 Digging	97	834,261	834,544	80,923,273
593 Dumping, filling	90	692,177	742,037	62,295,933
594 Pushing ,pulling	131	755,020	791,850	98,907,672
599 Handling materials, NEC	204	742,104	764,092	151,389,141
600 Physical activities, NEC	65	809,597	811,665	52,623,818
610 Climbing, descending	48	800,377	773,717	38,418,114
611 Descending ladder	395	710,797	774,229	280,764,782
612 Descending stairs	92	540,911	548,454	49,763,857
613 Descending scaffolds	36	858,688	813,561	30,912,759
614 Descending trees	31	621,799	691,625	19,275,784
615 Descending poles	33	1,142,318	1,144,103	37,696,493
619 Climbing, descending, NEC	106	804,108	825,448	85,235,411
620 Entering, exiting (other than vehicle)	80	800,504	766,426	64,040,342
630 Body position	82	859,519	826,913	70,480,589
631 Sitting	335	860,195	878,712	288,165,260
632 Standing	795	779,649	790,530	619,820,913
633 Walking	990	751,073	786,603	743,562,538
634 Reaching	45	750,384	715,530	33,767,273

Table 19. Number and Lifetime Costs of Occupational Traumatic Fatal Injury by Activity at the Time of Death, 1992-2001 (2003 Dollars), continued

Activity at Time of Death	Fatalities	Mean Cost	Median Cost	Total Cost
635 Bending	26	728,239	746,155	18,934,221
636 Running	50	900,244	871,624	45,012,203
637 Jumping	70	952,187	908,092	66,653,125
690 Other physical activity	220	823,477	764,549	181,164,994
700 Other/activities	94	813,542	792,069	76,472,912
710 Tending/(an est.,waiting on customers)	3,569	749,067	743,345	2,673,421,616
720 Office work	140	1,026,488	1,024,390	143,708,376
721 Clerical work	89	855,681	906,724	76,155,615
722 Managerial, admin. work	362	1,013,749	1,068,020	366,977,059
723 Research & devel.work	11	1,230,663	1,216,091	13,537,296
729 Office work, NEC	70	997,978	1,020,290	69,858,456
730 Health care & social services act	51	1,040,058	1,045,865	53,042,956
731 Caring for patients	102	943,699	873,339	96,257,317
732 Caring for social service clients	21	837,431	918,828	17,586,042
739 Health care & soc.service act, NEC	47	860,753	866,109	40,455,411
740 Animal care & tending	323	438,343	430,156	141,584,811
750 Legal service act	48	1,190,557	1,085,696	57,146,737
760 Teaching, giving or receiving training	56	1,071,659	1,125,419	60,012,917
770 Travel, NEC (added 1995)	20	1,038,315	1,036,459	20,766,293
790 Activity, NEC	1,169	834,265	811,082	975,255,645
999 Not reported	3,344	807,735	807,625	2,701,065,035

Note: Not all fatalities (1011) were classified with valid codes, therefore, the sum of the individual entries will not equal the total number of fatalities experienced in the 10 year period.

Table 20. Number and Lifetime Costs of Occupational Traumatic Fatal Injury by State of Injury, 1992-2001 (2003 Dollars)

State of Injury	Fatalities	Mean Cost	Median Cost	Total Cost
Alabama	1,364	826,328	838,918	1,127,110,725
Alaska	561	972,725	780,736	545,698,893
Arizona	738	899,688	887,247	663,969,773
Arkansas	846	838,962	844,150	709,762,236
California	5,911	846,240	840,282	5,002,126,753
Colorado	1,046	891,337	897,120	932,338,022
Connecticut	396	849,797	867,731	336,519,796
Delaware	132	820,442	843,026	108,298,394
Dist Columbia	160	832,001	821,932	133,120,124
Florida	3,498	836,625	823,170	2,926,513,033
Georgia	2,167	841,997	836,624	1,824,606,680
Hawaii	221	867,661	846,441	191,753,061
Idaho	466	814,497	775,543	379,555,783
Illinois	2,344	813,315	831,173	1,906,409,918
Indiana	1,595	821,297	846,990	1,309,968,945
Iowa	747	695,730	746,157	519,710,574
Kansas	900	742,468	781,041	668,221,370
Kentucky	1,274	747,914	795,133	952,842,569
Louisiana	1,466	903,632	898,489	1,324,724,857
Maine	227	802,944	794,340	182,268,374
Maryland	805	838,698	837,011	675,151,733
Massachusetts	664	826,228	817,639	548,615,158
Michigan	1,643	856,008	844,753	1,406,420,552
Minnesota	834	740,781	779,808	617,811,488
Mississippi	1,162	809,919	819,860	941,125,863
Missouri	1,397	790,956	814,138	1,104,964,919
Montana	473	790,285	773,416	373,804,600
Nebraska	592	725,623	760,723	429,568,804
Nevada	466	895,392	884,446	417,252,448
New Hampshire	142	903,332	925,682	128,273,191
New Jersey	1,151	832,526	823,748	958,237,440
New Mexico	478	897,499	943,906	429,004,561
New York	1,421	740,127	761,206	1,051,720,352
North Carolina	1,938	772,678	795,057	1,497,450,750
North Dakota	254	668,716	683,508	169,853,857

Table 20. Number and Lifetime Costs of Occupational Traumatic Fatal Injury by State of Injury, 1992-2001 (2003 Dollars), continued

State of Injury	Fatalities	Mean Cost	Median Cost	Total Cost
Ohio	1,997	819,110	844,735	1,635,762,640
Oklahoma	1,010	848,278	872,764	856,760,736
Oregon	727	817,721	811,665	594,483,008
Pennsylvania	2,462	824,326	844,312	2,029,489,775
Rhode Island	120	844,140	835,887	101,296,815
South Carolina	1,067	806,230	825,908	860,246,927
South Dakota	303	709,494	723,657	214,976,584
Tennessee	1,548	781,602	811,316	1,209,919,636
Texas	5,032	861,115	870,584	4,333,130,890
Utah	598	902,491	918,607	539,689,554
Vermont	108	796,088	791,002	85,977,553
Virginia	1,477	821,901	836,967	1,213,947,164
Washington	1,034	844,339	836,172	873,046,547
West Virginia	592	879,291	880,417	520,540,158
Wisconsin	1,115	760,591	784,663	848,058,648
Wyoming	313	833,869	850,540	261,001,125
Unknown	35	911,859	942,393	31,915,063

Table 21. Total Lifetime Cost of Occupational Traumatic Fatal Injury by Year and Discount Rate, 1992-2001 (2003 Dollars)

Year	3% discount rate	0% discount rate	5% discount rate	10% discount rate
All Years	48,705,018,420	71,958,930,673	39,538,447,889	26,672,675,767
1992	4,781,514,477	7,134,503,636	3,861,863,513	2,583,410,296
1993	4,905,306,114	7,294,754,716	3,968,212,666	2,661,126,712
1994	5,169,299,277	7,671,060,235	4,186,544,335	2,812,800,339
1995	4,890,676,844	7,237,526,976	3,966,306,745	2,670,795,559
1996	4,728,862,237	6,971,831,080	3,843,010,800	2,597,434,909
1997	4,851,903,254	7,164,699,260	3,940,970,999	2,662,549,326
1998	4,750,777,818	6,982,484,206	3,866,762,943	2,619,729,432
1999	4,700,939,270	6,911,542,859	3,826,022,301	2,592,131,801
2000	4,936,861,071	7,258,819,096	4,018,024,195	2,721,883,527
2001	4,988,878,059	7,331,708,610	4,060,729,392	2,750,813,867

Table 22. Mean and Median Lifetime Costs of Occupational Traumatic Fatal Injury by Year and Discount Rate, 1992-2001 (2003 Dollars)

Year	3% discount rate		0% discount rate		5% discount rate		10% discount rate	
All Years	825,271	831,786	1,219,292	1,259,314	669,950	671,286	451,949	447,727
1992	819,735	814,340	1,223,128	1,245,671	662,072	655,333	442,896	434,790
1993	819,463	828,230	1,218,636	1,264,824	662,916	663,369	444,558	437,676
1994	820,133	820,548	1,217,049	1,255,910	664,215	661,125	446,264	436,918
1995	820,721	827,215	1,214,554	1,259,273	665,599	663,832	448,195	441,476
1996	801,638	812,204	1,181,867	1,224,745	651,468	652,950	440,318	438,204
1997	806,902	822,550	1,191,535	1,236,679	655,408	662,880	442,799	440,393
1998	813,489	818,178	1,195,631	1,233,880	662,117	664,397	448,584	443,788
1999	806,751	830,625	1,186,124	1,238,765	656,602	672,391	444,848	451,498
2000	867,181	876,015	1,275,043	1,305,673	705,783	709,091	478,111	476,250
2001	880,805	875,898	1,294,440	1,330,474	716,937	720,721	485,666	488,564

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Appendices

Appendix A. Probability of Survival by Age, Sex, and Race

Age	White Male	White Female	Black Male	Black Female	Other Male	Other Female
16-17	0.99898	0.99960	0.99827	0.99955	0.99847	0.99957
17-18	0.99882	0.99955	0.99795	0.99949	0.99820	0.99951
18-19	0.99873	0.99953	0.99769	0.99942	0.99799	0.99945
19-20	0.99868	0.99952	0.99748	0.99936	0.99783	0.99941
20-21	0.99864	0.99951	0.99726	0.99928	0.99766	0.99935
21-22	0.99859	0.99950	0.99702	0.99920	0.99748	0.99930
22-23	0.99855	0.99949	0.99683	0.99912	0.99733	0.99924
23-24	0.99852	0.99949	0.99670	0.99904	0.99724	0.99918
24-25	0.99850	0.99949	0.99662	0.99897	0.99717	0.99912
25-26	0.99849	0.99949	0.99656	0.99890	0.99713	0.99906
26-27	0.99847	0.99949	0.99649	0.99882	0.99708	0.99900
27-28	0.99844	0.99947	0.99637	0.99873	0.99699	0.99893
28-29	0.99838	0.99945	0.99618	0.99862	0.99685	0.99884
29-30	0.99831	0.99942	0.99593	0.99849	0.99667	0.99874
30-31	0.99823	0.99938	0.99567	0.99835	0.99649	0.99863
31-32	0.99815	0.99934	0.99542	0.99822	0.99631	0.99853
32-33	0.99807	0.99930	0.99515	0.99809	0.99611	0.99843
33-34	0.99799	0.99926	0.99487	0.99797	0.99589	0.99833
34-35	0.99790	0.99922	0.99456	0.99784	0.99565	0.99822
35-36	0.99781	0.99918	0.99423	0.99771	0.99538	0.99811
36-37	0.99770	0.99912	0.99388	0.99757	0.99511	0.99800
37-38	0.99760	0.99906	0.99355	0.99741	0.99484	0.99787
38-39	0.99750	0.99898	0.99325	0.99725	0.99462	0.99774
39-40	0.99740	0.99889	0.99298	0.99707	0.99442	0.99761
40-41	0.99729	0.99879	0.99270	0.99687	0.99421	0.99746
41-42	0.99717	0.99869	0.99238	0.99665	0.99397	0.99729
42-43	0.99702	0.99857	0.99201	0.99641	0.99369	0.99711
43-44	0.99683	0.99843	0.99159	0.99616	0.99335	0.99690
44-45	0.99659	0.99827	0.99110	0.99589	0.99295	0.99665
45-46	0.99630	0.99807	0.99054	0.99558	0.99248	0.99637
46-47	0.99596	0.99785	0.98990	0.99522	0.99195	0.99604
47-48	0.99559	0.99760	0.98919	0.99481	0.99136	0.99567
48-49	0.99521	0.99735	0.98845	0.99436	0.99074	0.99527
49-50	0.99482	0.99709	0.98768	0.99388	0.99009	0.99485
50-51	0.99436	0.99679	0.98686	0.99336	0.98939	0.99439
51-52	0.99380	0.99644	0.98596	0.99279	0.98862	0.99388
52-53	0.99317	0.99606	0.98496	0.99219	0.98775	0.99335
53-54	0.99247	0.99566	0.98381	0.99157	0.98674	0.99279
54-55	0.99169	0.99524	0.98252	0.99090	0.98559	0.99219
55-56	0.99087	0.99479	0.98115	0.99021	0.98434	0.99157
56-57	0.98996	0.99429	0.97971	0.98946	0.98302	0.99090
57-58	0.98891	0.99372	0.97819	0.98858	0.98162	0.99013
58-59	0.98769	0.99307	0.97660	0.98753	0.98016	0.98923
59-60	0.98634	0.99236	0.97494	0.98637	0.97866	0.98824
60-61	0.98497	0.99163	0.97328	0.98518	0.97716	0.98722
61-62	0.98359	0.99088	0.97158	0.98398	0.97560	0.98619
62-63	0.98212	0.99007	0.96967	0.98273	0.97387	0.98509
63-64	0.98053	0.98919	0.96750	0.98141	0.97191	0.98390
64-65	0.97882	0.98823	0.96511	0.98003	0.96975	0.98260

Appendix A. Probability of Survival by Age, Sex, and Race, Continued

Age	White Male	White Female	Black Male	Black Female	Other Male	Other Female
65-66	0.97703	0.98722	0.96261	0.97858	0.96750	0.98123
66-67	0.97517	0.98617	0.96011	0.97709	0.96525	0.97982
67-68	0.97311	0.98500	0.95756	0.97558	0.96294	0.97838
68-69	0.97074	0.98366	0.95489	0.97399	0.96050	0.97688
69-70	0.96800	0.98209	0.95199	0.97226	0.95782	0.97527
70-71	0.96491	0.98031	0.94869	0.97035	0.95476	0.97350
71-72	0.96152	0.97832	0.94500	0.96823	0.95133	0.97149
72-73	0.95785	0.97614	0.94115	0.96589	0.94770	0.96925
73-74	0.95402	0.97382	0.93745	0.96344	0.94414	0.96685
74-75	0.95007	0.97140	0.93401	0.96096	0.94079	0.96436
75-76	0.94586	0.96889	0.93069	0.95848	0.93749	0.96183
76-77	0.94125	0.96613	0.92715	0.95588	0.93397	0.95918
77-78	0.93628	0.96293	0.92325	0.95295	0.93012	0.95623
78-79	0.93080	0.95910	0.91855	0.94939	0.92556	0.95274
79-80	0.92467	0.95458	0.91287	0.94508	0.92011	0.94854
80-81	0.91754	0.94947	0.90597	0.93992	0.91356	0.94353
81-82	0.90951	0.94394	0.89831	0.93419	0.90630	0.93791
82-83	0.90109	0.93785	0.89063	0.92821	0.89894	0.93197
83-84	0.89285	0.93122	0.88422	0.92256	0.89251	0.92630
84-85	0.88481	0.92393	0.87938	0.91736	0.88727	0.92104
85-86	0.87564	0.91555	0.87485	0.91203	0.88173	0.91548
86-87	0.86478	0.90598	0.86914	0.90572	0.87493	0.90895
87-88	0.85305	0.89569	0.86204	0.89871	0.86682	0.90169
88-89	0.84073	0.88488	0.85264	0.89067	0.85667	0.89333
89-90	0.82781	0.87327	0.84088	0.88140	0.84440	0.88367
90-91	0.81383	0.85985	0.82715	0.87058	0.83023	0.87248
91-92	0.79841	0.84464	0.81249	0.85862	0.81498	0.86021
92-93	0.78227	0.82899	0.79838	0.84682	0.80001	0.84804
93-94	0.76624	0.81374	0.78776	0.83667	0.78802	0.83732
94-95	0.75107	0.79852	0.78085	0.82768	0.77939	0.82755
95-96	0.73671	0.78263	0.77341	0.81756	0.77097	0.81662
96-97	0.72086	0.76566	0.76208	0.80444	0.75952	0.80318
97-98	0.70601	0.74909	0.75018	0.79054	0.74750	0.78911
98-99	0.69131	0.73285	0.73769	0.77586	0.73487	0.77443
99-100	0.67587	0.71682	0.72458	0.76242	0.72162	0.76089

Source: National Center for Health Statistics: Vital Statistics of the United States, Vol 1 No 1, U.S. Decennial Life Tables for 1989-91

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001 (Current Dollars)

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Total	26260	26728	27144	27976	28964	30108	31096	32136	33592	34944
	Managerial and professional specialty occupations	40404	41132	41756	43108	44304	45500	47060	49504	51688	53976
A	Executive, administrative, and managerial occupations	40768	41132	41444	43316	43992	45136	47580	50284	52728	55120
003	Legislators	40768	41132	41444	43316	43992	45136	47580	50284	52728	55120
004	Chief executives, and general administrators, public administration	40768	41132	41444	43316	43992	45136	47580	50284	52728	55120
005	Administrators and officials, public administration	41756	41652	42588	43108	44044	45552	49764	52364	50960	54652
006	Administrators, protective services	40768	41132	41444	43316	43992	45136	47580	50284	52728	55120
007	Financial managers	51064	50180	46228	48984	50908	51532	52884	60008	62452	65624
008	Personnel and labor relations managers	40768	41132	41444	43316	59800	47528	49244	52728	59956	57876
009	Purchasing managers	50024	47008	46904	50076	50752	55068	50180	51428	53820	58500
013	Managers, marketing, advertising, and public relations	47580	50908	53404	55276	54236	49400	58656	64532	65000	63388
014	Administrators, education and related fields	45396	48672	48360	49504	49712	44408	57772	55952	57096	61828
015	Managers, medicine and health	43680	45604	44200	43576	51376	45136	45188	52312	54028	59592
016	Postmasters and mail superintendents	40768	46020	41444	43316	43992	45136	47580	50284	52728	55120
017	Managers, food service and lodging establishments	24804	23920	25220	26832	26832	29016	30732	32084	33852	36764
018	Managers, properties and real estate	28496	31928	27768	31928	32240	33592	33176	35308	39208	45760
019	Funeral directors	40768	41132	41444	43316	43992	45136	47580	50284	52728	55120
021	Managers, service organizations, n.e.c.	30784	36504	36660	38376	43992	45136	47580	50284	52728	55120
022	Managers and administrators, n.e.c.	46228	45760	45760	47424	43992	45136	47580	50284	52728	55120
	Management-related occupations	36816	37076	37336	38064	38948	40820	41080	44044	48412	48984
023	Accountants and auditors	36712	36920	37648	38844	40092	41132	42692	46332	49556	49608
**	Underwriters and other financial officers	41912	37076	37336	38064	38948	40820	41080	44044	52728	48984
024	Underwriters	41912	37076	37336	38064	38948	40820	41080	44044	52728	48984
025	Other financial officers	41756	41600	42484	40716	43940	48516	46852	47996	56368	55380
026	Management analysts	50960	37076	46072	51272	48880	54340	50128	56160	69680	63128
027	Personnel, training, and labor relations specialists	39572	38948	36660	35932	36764	38064	39260	37804	44928	45552
028	Purchasing agents and buyers, farm products	36816	37076	37336	38064	38948	40820	41080	44044	52728	48984
029	Buyers, wholesale and retail trade, except farm products	30784	27456	27768	29432	33228	31252	33644	35100	41808	41444
033	Purchasing agents and buyers, n.e.c.	32396	35152	35100	37544	38948	40820	41080	44044	52728	48984
034	Business and promotion agents	36816	37076	37336	38064	38948	40820	41080	44044	52728	48984
035	Construction inspectors	31408	30784	32032	36296	34840	40820	39520	38896	37700	36296
036	Inspectors and compliance officers, except construction	33800	35516	37076	36764	39000	39052	39312	40144	44460	47996
037	Management-related occupations, n.e.c.	34164	36556	29172	29484	38948	40820	41080	44044	52728	48984

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
B	Professional specialty occupations	40040	41132	42068	43004	44564	45916	46540	48828	50804	53092
	Engineers, architects, and surveyors	45084	47424	46852	48152	49608	51428	52364	54704	58344	59384
043	Architects	36504	39780	39780	38532	41548	46384	46436	51116	58552	54028
	Engineers	45604	47788	47164	48620	50076	51688	52572	55016	58552	59748
044	Aerospace engineers	50596	53248	50440	51324	57148	58708	59800	62504	67028	64948
045	Metallurgical and materials engineers	45604	47788	47164	48620	50076	51688	52572	55016	50804	59748
046	Mining engineers	45604	47788	47164	48620	50076	51688	52572	55016	50804	59748
047	Petroleum engineers	45604	47788	47164	48620	50076	51688	52572	55016	50804	59748
048	Chemical engineers	51428	52104	47164	55484	56368	58916	54132	68224	65260	72852
049	Nuclear engineers	45604	47788	47164	48620	50076	51688	52572	55016	50804	59748
053	Civil engineers	43472	45812	46384	44772	46748	50076	52052	51168	54392	55068
054	Agricultural engineers	45604	47788	47164	48620	50076	51688	52572	55016	50804	59748
055	Electrical and electronic engineers	46852	49452	48568	49816	52104	51948	55484	56524	59800	60892
056	Industrial engineers	41496	44928	41548	44720	44876	47216	47424	51532	51740	57408
057	Mechanical engineers	43316	46748	46800	48152	50388	51324	52364	54132	58656	58968
058	Marine engineers and naval architects	45604	47788	47164	48620	50076	51688	52572	55016	50804	59748
059	Engineers, n.e.c.	46644	46280	45708	46696	50076	51688	52572	55016	50804	59748
063	Surveyors and mapping scientists	45084	47424	46852	48152	50076	51688	52572	55016	50804	59384
	Mathematical and computer scientists	43628	45708	45448	46540	48308	49244	51272	54912	54860	60268
064	Computer systems analysts and scientists	43992	45136	45760	47320	48412	49504	51792	56108	55380	60372
065	Operations and systems researchers and analysts	41756	46852	42484	41548	46228	48152	48724	49504	51272	55848
066	Actuaries	43628	45708	45448	46540	48308	49244	51272	54912	54860	60268
067	Statisticians	43628	45708	45448	46540	48308	49244	51272	54912	54860	60268
068	Mathematical scientists, n.e.c.	43628	45708	45448	46540	48308	49244	51272	54912	54860	60268
	Natural scientists	40872	40768	40196	41288	42744	45656	47216	48828	52364	51792
069	Physicists and astronomers	40872	40768	40196	41288	42744	45656	47216	48828	54860	51792
073	Chemists, except biochemists	41340	41548	43836	42380	46800	50700	51064	52104	52676	56524
074	Atmospheric and space scientists	40872	40768	40196	41288	42744	45656	47216	48828	54860	51792
075	Geologists and geodesists	40872	40768	40196	41288	42744	45656	47216	48828	54860	51792
076	Physical scientists, n.e.c.	40872	40768	40196	41288	42744	45656	47216	48828	54860	51792
077	Agricultural and food scientists	40872	40768	40196	41288	42744	45656	47216	48828	54860	51792
078	Biological and life scientists	40872	33644	39364	37336	38376	39468	40612	41652	45448	42952

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
079	Forestry and conservation scientists	40872	40768	40196	41288	42744	45656	47216	48828	54860	51792
083	Medical scientists	40872	40768	40196	41288	42744	45656	47216	41600	54860	51792
	Health diagnosing occupations	53508	57356	52884	59956	65312	60112	63804	69784	75868	71344
084	Physicians	61880	61672	55276	64532	71656	63440	65260	70928	80756	73320
085	Dentists	53508	57356	52884	59956	65312	60112	63804	69784	50804	71344
086	Veterinarians	53508	57356	52884	59956	65312	60112	63804	69784	50804	71344
087	Optometrists	53508	57356	52884	59956	65312	60112	63804	69784	50804	71344
088	Podiatrists	53508	57356	52884	59956	65312	60112	63804	69784	50804	71344
089	Health diagnosing practitioners, n.e.c.	53508	57356	52884	59956	65312	60112	63804	69784	50804	71344
	Health assessment and treating occupations	38324	39832	39416	41444	39832	44824	41132	46124	49348	51116
095	Registered nurses	32916	35256	36868	37180	37908	40456	40248	41132	46280	48516
096	Pharmacists	46644	47892	50076	54964	54444	58708	59592	63544	68224	73892
097	Dietitians	38324	39832	39416	41444	39832	44824	41132	46124	50804	51116
	Therapists	34684	33800	33904	35620	34216	38116	37076	41236	43212	42120
098	Respiratory therapists	34684	33800	33904	35620	34216	38116	37076	41236	43212	42120
099	Occupational therapists	34684	33800	33904	35620	34216	38116	37076	41236	43212	42120
103	Physical therapists	34684	33800	33904	35620	34216	38116	37076	41236	43212	42120
104	Speech therapists	34684	33800	33904	35620	34216	38116	37076	41236	43212	42120
105	Therapists, n.e.c.	34684	33800	33904	35620	34216	38116	37076	41236	43212	42120
106	Physicians' assistants	38324	39832	39416	41444	39832	44824	41132	46124	50804	42120
	Teachers, college and university	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
113	Earth, environmental and marine science teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
114	Biological science teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
115	Chemistry teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
116	Physics teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
117	Natural science teachers, n.e.c.	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
118	Psychology teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
119	Economics teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
123	History teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
124	Political science teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
125	Sociology teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
126	Social science teachers, n.e.c.	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
127	Engineering teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
128	Mathematical science teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
129	Computer science teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
133	Medical science teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
134	Health specialties teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
135	Business, commerce, and marketing teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
136	Agriculture and forestry teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
137	Art, drama, and music teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
138	Physical education teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
139	Education teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
143	English teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
144	Foreign language teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
145	Law teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
146	Social work teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
147	Theology teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
148	Trade and industrial teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
149	Home economics teachers	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
153	Teachers, postsecondary, n.e.c.	46592	46488	46280	48932	48724	48672	51896	53976	53040	58552
154	Postsecondary teachers, subject not specified	42016	44304	39676	45448	48724	48672	51896	53976	53040	58552
	Teachers, except postsecondary	32604	33488	36036	36192	37596	38116	38792	39936	43004	40560
155	Teachers, prekindergarten and kindergarten	32604	33488	36036	36192	37596	38116	38792	39936	43004	40560
156	Teachers, elementary school	34216	34632	33800	37076	37388	37388	38948	40820	44720	40040
157	Teachers, secondary school	33644	34580	37856	37596	39520	39728	40196	41756	43472	42952
158	Teachers, special education	32604	33488	36036	36192	37596	39520	38116	38688	42432	38584
159	Teachers, n.e.c.	30004	29900	31356	31460	37596	38116	38792	39936	43004	40560
163	Counselors, educational and vocational	31824	37804	39728	38272	41548	39832	37700	46904	47528	44408
	Librarians, archivists, and curators	40040	41132	42068	43004	44564	45916	46540	48828	50804	53092
164	Librarians	40040	41132	42068	43004	44564	45916	46540	48828	50804	53092
165	Archivists and curators	40040	41132	42068	43004	44564	45916	46540	48828	50804	53092

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Social scientists and urban planners	45344	39572	43784	40352	38272	46644	45656	44044	50076	54912
166	Economists	45344	51688	43784	48256	45292	50440	51532	50804	59696	54912
167	Psychologists	45344	39572	38480	34216	34736	40248	38480	39520	46436	47528
168	Sociologists	45344	39572	43784	40352	38272	46644	45656	44044	50076	54912
169	Social scientists, n.e.c.	45344	39572	43784	40352	38272	46644	45656	44044	50076	54912
173	Urban planners	45344	39572	43784	40352	38272	46644	45656	44044	50076	54912
	Social, recreation, and religious workers	26156	27040	28132	26832	30004	29016	30836	34008	35256	35828
174	Social workers	27612	29796	29328	29380	30732	28652	31668	34372	33124	35204
175	Recreation workers	26156	27040	28132	26832	30004	29016	30836	34008	35256	35828
176	Clergy	25948	26312	28600	25844	28080	30576	31356	35152	37232	37596
177	Religious workers, n.e.c.	26156	27040	28132	26832	30004	29016	30836	34008	35256	35828
	Lawyers and judges	60164	63388	64116	63908	65416	65572	70096	71188	75296	79820
178	Lawyers	61100	63024	64324	60892	65572	65884	70200	69680	74828	80444
179	Judges	60164	63388	64116	63908	65416	65572	70096	71188	75296	79820
	Writers, artists, entertainers, and athletes	32240	33332	32760	33644	37856	37960	37076	38896	41028	43836
183	Authors	32240	33332	32760	33644	37856	37960	37076	38896	41028	43836
184	Technical writers	32240	33332	32760	33644	37856	37960	37076	38896	41028	43836
185	Designers	36452	35100	34216	34684	39884	41184	37440	39364	41860	45968
186	Musicians and composers	32240	33332	32760	33644	37856	37960	37076	38896	41028	43836
187	Actors and directors	32240	33332	32760	33644	37856	35100	41652	38896	41028	43836
188	Painters, sculptors, craft artists, and artist printmakers	32240	33332	32760	26936	27664	30732	35360	33644	39000	34424
189	Photographers	32240	33332	32760	33644	37856	37960	37076	38896	41028	43836
193	Dancers	32240	33332	32760	33644	37856	37960	37076	38896	41028	43836
194	Artists, performers, and related workers, n.e.c.	32240	33332	32760	33644	37856	37960	37076	38896	41028	43836
195	Editors and reporters	33124	35464	34892	34112	39312	39988	42224	41756	41340	45032
197	Public relations specialists	36348	39208	34892	39208	47216	37960	37076	45812	47996	47684
198	Announcers	32240	33332	32760	33644	37856	37960	37076	38896	41028	43836
199	Athletes	32240	33332	32760	33644	37856	37960	37076	38896	41028	43836
	Technical, sales, and administrative support occupations	26988	27768	28496	28912	29484	30576	31512	32552	34060	34684
C	Technicians and related support occupations	30732	31980	32344	33332	33800	34684	36452	37856	39572	40716
	Health technologists and technicians	26052	27144	28912	28860	27924	28756	30576	30888	32240	36296
203	Clinical laboratory technologists and technicians	30004	31876	31044	29172	30056	30680	30420	36868	32448	37284
204	Dental hygienists	26052	27144	28912	28860	27924	28756	30576	30888	32240	36296
205	Health record technologists and technicians	26052	27144	28912	28860	27924	28756	30576	30888	32240	36296

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
206	Radiologic technicians	26052	27144	28912	28860	27924	28756	30576	30888	32240	36296
207	Licensed practical nurses	26052	27144	28912	28860	27924	28756	30576	30888	32240	36296
208	Health technologists and technicians, n.e.c.	24960	25740	28912	26936	27924	28756	30576	30888	32240	36296
	Technologists and technicians, except health	30732	31980	32344	31876	33800	34684	36452	37856	39572	40716
	Engineering and related technologists and technicians	29952	29900	32344	31876	32292	32812	34736	34996	37492	38636
213	Electrical and electronic technicians	31564	31720	26156	32344	32344	34060	34580	36452	37700	39052
214	Industrial engineering technicians	29952	29900	30732	31876	32292	32812	34736	34996	37492	38636
215	Mechanical engineering technicians	29952	29900	32500	31876	32292	32812	34736	34996	37492	38636
216	Engineering technicians, n.e.c.	30264	29744	30160	30732	32292	32812	34736	34996	37492	38636
217	Drafting occupations	28132	28392	29224	32916	31616	31512	35100	34476	37544	38324
218	Surveying and mapping technicians	23868	24804	26780	31876	23868	31668	35464	34996	33748	35360
	Science technicians	27144	27144	29952	31460	31096	30576	32396	34112	35256	35828
223	Biological technicians	27144	27144	29952	31460	31096	30576	32396	34112	35256	35828
224	Chemical technicians	31148	30680	33176	35932	33696	32240	35776	34112	38012	35828
225	Science technicians, n.e.c.	27144	26884	30888	30680	31096	30576	32396	34112	35256	35828
	Technicians, except health, engineering, and science	33644	38220	39000	38896	41912	44512	45240	46904	49764	49348
226	Airplane pilots and navigators	45760	58448	52832	49920	59436	53092	71812	54600	66144	59540
227	Air traffic controllers	33644	38220	39000	38896	41912	44512	45240	46904	49764	49348
228	Broadcast equipment operators	33644	38220	39000	38896	41912	44512	45240	46904	49764	49348
229	Computer programmers	37596	40196	39468	39624	41444	45188	45968	48620	50336	50700
233	Tool programmers, numerical control	33644	38220	39000	38896	41912	44512	45240	46904	49764	49348
234	Legal assistants	33644	38220	39000	30264	41912	44512	29172	46904	36556	34580
235	Technicians, n.e.c.	30212	31512	29484	38896	41912	44512	45240	46904	49764	49348
D	Sales occupations	27196	28288	29900	30108	30628	31356	32344	34632	35568	35984
243	Supervisors and proprietors	28652	30056	30368	30732	31616	32188	33748	35932	36140	37024
	Sales representatives, finance and business services	36296	36244	38428	37492	37804	38688	40144	42692	46124	46644
253	Insurance sales occupations	35308	32656	37960	40404	39884	39260	39520	39000	44512	44200
254	Real estate sales occupations	34736	37648	37960	33800	36140	35620	39676	39884	46280	43576
255	Securities and financial services sales occupations	51272	47268	48932	48672	50804	44616	48360	50908	58136	60112
256	Advertising and related sales occupations	29744	37232	33020	31304	31564	36972	39520	46384	45240	40664
257	Sales occupations, other business services	33332	32916	36712	34320	32812	35724	37180	42068	40404	40300
	Sales representatives, commodities, except retail	34268	35100	29900	36556	38220	38532	39780	41184	43264	45552
258	Sales engineers	34268	35100	29900	18980	38220	38532	39780	41184	43264	45552
259	Sales representatives, mining, manufacturing and wholesale	34268	35100	34424	18980	38220	38532	39780	41184	43264	45552

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Sales workers, retail and personal services	17264	19032	19032	30108	20072	20384	21424	21996	24440	23920
263	Sales workers, motor vehicles and boats	25116	26000	28548	29952	31044	30836	31668	35308	36556	35100
264	Sales workers, apparel	17264	19032	19032	30108	20072	20384	21424	21996	24440	23920
265	Sales workers, shoes	17264	19032	19032	30108	20072	20384	21424	21996	24440	23920
266	Sales workers, furniture and home furnishings	20020	23244	24440	22048	21112	26468	26468	27872	30888	28340
267	Sales workers, radio, tv, hi-fi, and appliances	23036	24024	21528	23920	22256	24648	22412	26624	29952	26468
268	Sales workers, hardware and building supplies	17316	19240	18356	18928	20748	21580	23972	24596	24232	25480
269	Sales workers, parts	16744	18616	19968	20176	22204	19500	20956	20956	24336	24492
274	Sales workers, other commodities	16796	16744	18408	16484	17680	19812	20176	20384	23920	22256
275	Sales counter clerks	17264	19032	19032	30108	20072	20384	21424	21996	24440	23920
276	Cashiers	11908	13104	13728	13312	14248	13988	15704	15392	16276	17004
277	Street and door-to-door sales workers	17264	19032	19032	30108	20072	20384	21424	21996	24440	23920
278	News vendors	17264	19032	19032	30108	20072	20384	21424	21996	24440	23920
	Sales-related occupations	27196	28288	29900	30108	30628	31356	32344	34632	35568	35984
283	Demonstrators, promoters and models, sales	27196	28288	29900	30108	30628	31356	32344	34632	35568	35984
284	Auctioneers	27196	28288	29900	30108	30628	31356	32344	34632	35568	35984
285	Sales support occupations, n.e.c.	27196	28288	29900	30108	30628	31356	32344	34632	35568	35984
E	Administrative support occupations, including clerical	25064	25584	25064	25428	25428	26728	26936	28028	29276	29952
	Supervisors, administrative support occupations	33904	35984	33956	33748	32448	35932	35308	36452	36556	36556
303	Supervisors, general office	36972	37960	34268	35204	33176	39208	36296	36712	36712	39676
304	Supervisors, computer equipment operators	33904	35984	33956	33748	32448	35932	35308	36452	36556	36556
305	Supervisors, financial records processing	33904	35984	33956	33748	32448	35932	35308	36452	36556	36556
306	Chief communications operators	33904	35984	33956	33748	32448	35932	35308	36452	36556	36556
307	Supervisors, distribution, scheduling, and adjusting clerks	28028	31824	30056	31044	28756	31200	33280	34736	35984	33228
	Computer equipment operators	25844	26364	25948	27248	27976	27352	30732	31720	32968	33488
308	Computer operators	25844	26520	26000	27404	27976	27300	30940	31824	32916	33644
309	Peripheral equipment operators	25844	26364	25948	27248	27976	27352	30732	31720	32968	33488
	Secretaries, stenographers, and typists	21008	20748	20644	22932	20228	26728	25168	28028	29276	29952
313	Secretaries	21008	20748	20644	22932	20228	26728	25168	28028	29276	29952
314	Stenographers	21008	20748	20644	22932	20228	26728	25168	28028	29276	29952
315	Typists	21008	20748	20644	22932	20228	26728	25168	28028	29276	29952
	Information clerks	20072	19968	19344	20956	19084	20384	23556	25844	25272	26572
316	Interviewers	20072	19968	19344	20956	19084	20384	23556	25844	25272	26572
317	Hotel clerks	20072	19968	19344	20956	19084	20384	23556	25844	25272	26572

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
318	Transportation ticket and reservation agents	20072	19968	23972	25896	23816	20384	29276	27404	31096	35412
319	Receptionists	20072	19968	19344	20956	19084	20384	23556	25844	25272	26572
323	Information clerks, n.e.c.	20072	19968	19344	20956	19084	20384	23556	25844	25272	26572
	Records processing occupations, except financial	20124	23088	22464	22048	20592	25064	21788	26676	25584	25168
325	Classified-ad clerks	20124	23088	22464	22048	20592	25064	21788	26676	25584	25168
326	Correspondence clerks	20124	23088	22464	22048	20592	25064	21788	26676	25584	25168
327	Order clerks	24856	23088	22464	29432	24232	26052	23660	32708	27456	26312
328	Personnel clerks, except payroll and timekeeping	20124	23088	22464	22048	20592	25064	21788	26676	25584	25168
329	Library clerks	20124	23088	22464	22048	20592	25064	21788	26676	25584	25168
335	File clerks	20124	23088	22464	22048	17368	25064	21788	26676	25584	25168
336	Records clerks	20124	23088	22464	22048	20592	25064	21788	26676	25584	25168
	Financial records processing occupations	22828	23660	21060	23140	22828	23868	24232	25428	28288	26988
337	Bookkeepers, accounting, and auditing clerks	22464	20592	21320	23140	23400	23192	23660	24856	28028	26312
338	Payroll and timekeeping clerks	22828	23660	21060	23140	22828	23868	24232	25428	28288	26988
339	Billing clerks	22828	23660	21060	23140	22828	23868	24232	25428	28288	26988
343	Cost and rate clerks	22828	23660	21060	23140	22828	23868	24232	25428	28288	26988
344	Billing, posting, and calculating machine operators	22828	23660	21060	23140	22828	23868	24232	25428	28288	26988
	Duplicating, mail, and other office machine operators	25064	25584	25064	25428	25428	26728	26936	28028	29276	29952
345	Duplicating machine operators	25064	25584	25064	25428	25428	26728	26936	28028	29276	29952
346	Mail preparing and paper handling machine operators	25064	25584	25064	25428	25428	26728	26936	28028	29276	29952
347	Office machine operators, n.e.c.	25064	25584	25064	25428	25428	26728	26936	28028	29276	29952
	Communications equipment operators	25064	25584	25064	25428	25428	26728	26936	28028	29276	29952
348	Telephone operators	25064	25584	25064	25428	25428	26728	26936	28028	29276	29952
353	Communications equipment operators, n.e.c.	25064	25584	25064	25428	25428	26728	26936	28028	29276	29952
	Mail and message distributing occupations	30420	31512	31824	32188	32656	32448	32916	34580	35308	36400
354	Postal clerks, except mail carriers	31980	32708	33748	33332	25428	35672	34736	36452	37856	38376
355	Mail carriers, postal service	31460	33280	34060	34580	35568	35932	36348	37128	38428	39156
356	Mail clerks, except postal service	16068	16536	16588	18772	19916	20592	23036	21528	20904	25844
357	Messengers	18044	19396	19396	19812	19032	19604	21216	23764	25688	28340
	Material recording, scheduling, and distributing clerks	21528	21632	22048	22672	23088	25012	24752	25220	26208	26676
359	Dispatchers	25532	25532	24388	24856	26936	28132	26832	30316	33748	32968
363	Production coordinators	31564	31928	31772	36296	32136	32604	37648	38168	37908	40300
364	Traffic, shipping, and receiving clerks	18980	19708	20696	20280	19864	21424	21632	21788	23660	24336
365	Stock and inventory clerks	20384	22048	21372	22984	24440	25220	23504	26260	26156	25636

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
366	Meter readers	21528	24856	22048	22672	25428	26728	26936	28028	29276	26676
368	Weighers, measurers, checkers, and samplers	21528	21632	22048	22672	25428	26728	26936	28028	29276	26676
373	Expediters	22620	18252	22048	21632	25428	23504	24804	25324	23400	28600
374	Material recording, scheduling, and distributing clerks, n.e.c..	21528	21632	22048	22672	25428	26728	26936	28028	29276	26676
	Adjusters and investigators	25792	27820	26104	26156	27664	28860	24284	27872	30368	30212
375	Insurance adjusters, examiners, and investigators	30784	34944	31252	32188	33748	34060	34892	34320	35204	34424
376	Investigators and adjusters, except insurance	25792	25844	26364	24336	25272	26416	27144	26572	28912	28340
377	Eligibility clerks, social welfare	25792	27820	26104	26156	25428	26728	26936	28028	29276	30212
378	Bill and account collectors	25792	21112	26104	26156	25428	26728	25688	25428	29276	26208
	Miscellaneous administrative support occupations	24804	23400	24024	22516	22152	24544	25064	25116	27196	27040
379	General office clerks	21840	18668	20956	20228	21996	23400	23556	23972	24492	25012
383	Bank tellers	24804	23400	24024	22516	25428	26728	26936	28028	29276	27040
384	Proofreaders	24804	23400	24024	22516	25428	26728	26936	28028	29276	27040
385	Data-entry keyers	18824	18512	21632	20384	21164	24596	24440	22516	25428	25116
386	Statistical clerks	24804	23400	24024	22516	25428	26728	26936	28028	29276	27040
387	Teachers' aides	24804	23400	24024	22516	25428	26728	26936	28028	29276	27040
389	Administrative support occupations, n.e.c.	28236	28548	27976	26780	25428	26728	26936	28028	29276	27040
G	Service occupations	17160	18200	18200	18564	18564	19344	20228	20904	21528	22776
	Private household occupations	17160	18200	18200	18564	18564	19344	20228	20904	21528	22776
403	Launderers and ironers	17160	18200	18200	18564	18564	19344	20228	20904	21528	22776
404	Cooks, private household	17160	18200	18200	18564	18564	19344	20228	20904	21528	22776
405	Housekeepers and butlers	17160	18200	18200	18564	18564	19344	20228	20904	21528	22776
406	Child care workers, private households	17160	18200	18200	18564	18564	19344	20228	20904	21528	22776
407	Private household cleaners and servants	17160	18200	18200	18564	18564	19344	20228	20904	21528	22776
	Protective service occupations	26052	27248	27976	28704	29224	29900	31876	31876	34268	34216
	Supervisors, protective service occupations	33436	37076	37908	36764	40196	40664	40872	42380	45812	47840
413	Supervisors, firefighting and fire prevention	26052	27248	27976	28704	29224	29900	31876	31876	34268	34216
414	Supervisors, police and detectives	37908	39468	43160	40820	43940	44408	44928	46228	48932	50440
415	Supervisors, guards	26052	27248	27976	28704	29224	29900	31876	31876	34268	47840
	Firefighting and fire prevention occupations	32604	32032	33280	32708	34164	37024	38012	38584	41756	41392
416	Fire inspection and fire prevention occupations	32604	32032	33280	32708	29224	29900	31876	31876	34268	34216
417	Firefighting occupations	33228	32240	33072	32604	34372	37180	38012	38740	41860	41236
	Police and detectives	28704	30836	30940	31824	32032	32656	34424	35412	37232	37284
418	Police and detectives, public service	32760	33540	34632	34840	35308	36764	38376	39832	41184	41392

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
423	Sheriffs, bailiffs, and other law enforcement officers	26000	30160	27352	29276	26884	28756	30940	33540	35984	33852
424	Correctional institution officers	25532	26364	25688	26624	28132	27456	29692	28080	32136	31356
	Guards	16848	17680	17368	17576	17836	18304	19656	20904	21736	23244
425	Crossing guards	16848	17680	17368	17576	29224	29900	31876	31876	34268	34216
426	Guards and police, except public service	16900	17680	17420	17836	17836	18252	19864	20956	21684	23452
427	Protective service occupations, n.e.c.	16848	17680	17368	17576	29224	29900	31876	31876	34268	34216
	Service occupations, except protective and private household	14716	15080	15236	15600	15808	16484	16900	17472	18564	19448
	Food preparation and service occupations	13156	13416	14092	14196	14456	15340	15756	16172	16900	17836
433	Supervisors, food preparation and service occupations	19864	20852	19344	20020	18564	19656	22204	21580	21580	23140
434	Bartenders	14300	15912	16432	16380	19656	17732	19708	17368	19240	21216
435	Waiters and waitresses	13260	14144	15496	16328	16016	17056	17836	16900	17992	18876
436	Cooks	13676	13728	13988	13988	14508	15600	15860	16484	16848	18044
438	Food counter, fountain, and related occupations	13156	13416	14092	14196	15808	16484	16900	17472	18564	17836
439	Kitchen workers, food preparation	13156	13416	14092	14196	15808	16484	16900	17472	15444	17836
443	Waiters'/ Waitresses' assistants	11128	10816	11596	13988	12428	14040	13936	15080	16224	16588
444	Miscellaneous food preparation occupations	11076	11024	11648	11856	11752	12428	13676	13832	15236	14976
	Health service occupations	15184	15756	16120	17420	17784	17836	17784	19136	19604	21216
445	Dental assistants	15184	15756	16120	17420	15808	16484	16900	17472	19604	21216
446	Health aides, except nursing	15184	15756	18252	17940	18460	17680	16900	17472	19500	22776
447	Nursing aides, orderlies, and attendants	14352	15548	15652	17212	17628	17732	17160	19084	19656	20644
	Cleaning and building service occupations, except household	15964	16640	16328	16380	16692	17628	18616	18876	19864	20748
448	Supervisors, cleaning and building service workers	21112	21684	21580	23504	24336	24180	23764	24544	26052	26000
449	Maids and housemen	14404	14248	14664	14924	15600	15184	15860	17160	18096	20020
453	Janitors and cleaners	15704	16536	15964	15964	16276	17160	18460	18252	19344	20228
454	Elevator operators	15964	16640	16328	16380	15808	16484	16900	17472	19864	19448
455	Pest control occupations	15964	16640	16328	16380	21892	16484	18512	23400	25324	25116
	Personal service occupations	16588	15912	16484	18668	18720	19864	19136	19708	20800	21008
456	Supervisors, personal service occupations	16588	15912	16484	18668	15808	16484	16900	17472	20800	21008
457	Barbers	16588	15912	16484	18668	15808	16484	16900	17472	20800	21008
458	Hairdressers and cosmetologists	16588	15912	16484	18668	15808	16484	16900	17472	20800	21008
459	Attendants, amusement and recreation facilities	16588	15184	17628	19240	18928	17004	19864	19968	22256	20176
461	Guides	16588	15912	16484	18668	15808	16484	16900	17472	20800	21008
462	Ushers	16588	15912	16484	18668	15808	16484	16900	17472	20800	21008
463	Public transportation attendants	16588	15912	16484	18668	15808	16484	16900	17472	20800	21008

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1 992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
464	Baggage porters and bellhops	16588	15912	16484	18668	15808	16484	16900	17472	20800	21008
465	Welfare service aides	16588	15912	16484	18668	15808	16484	16900	17472	20800	21008
466	Family child care providers	16588	15912	16484	18668	15808	16484	16900	17472	20800	21008
467	Early childhood teacher's assistants	16588	15912	16484	18668	15808	16484	16900	17472	20800	21008
468	Child care workers, n.e.c.	16588	15912	16484	18668	15808	16484	16900	17472	20800	21008
469	Personal service occupations, n.e.c.	16588	15912	16484	18668	15808	16484	16900	17472	20800	21008
I	Precision production, craft, and repair occupations	26156	26572	26780	27768	29120	29588	30524	31512	32656	33696
	Mechanics and repairers	25792	26468	26988	27976	29692	30212	31148	32344	33748	34840
503	Supervisors, mechanics and repairers	31928	34840	35152	37232	37024	39780	38896	42640	42328	41288
	Mechanics and repairers, except supervisors	25428	26156	26624	27352	29276	29640	30784	31980	33332	34372
	Vehicle and mobile equipment	23348	24648	25324	26000	27248	27976	28704	30888	31460	31980
	Mechanics and repairers	23348	24648	25324	26000	29120	29588	30524	31512	32656	41288
505	Automobile mechanics	21268	21944	22932	24336	24960	25532	25688	28860	27976	28340
506	Automobile mechanic apprentices	21268	21944	22932	24336	29120	29588	30524	31512	33748	34840
507	Bus, truck, and stationary engine mechanics	23608	24908	25532	27664	28340	29120	29172	30576	32864	35620
508	Aircraft engine mechanics	31772	32500	36816	31720	37544	38064	40664	38480	38896	41756
509	Small engine repairers	23348	24648	25324	26000	29120	29588	30524	21788	33748	34840
514	Automobile body and related repairers	20800	21164	23660	20592	23868	26000	26520	30472	29744	29900
515	Aircraft mechanics, except engine	23348	24648	25324	26000	29120	29588	30524	31512	33748	34840
516	Heavy equipment mechanics	26832	28028	28756	29952	31876	30888	33072	34788	34580	35880
517	Farm equipment mechanics	23348	24648	25324	26000	29120	29588	30524	31512	33748	34840
518	Industrial machinery repairers	25948	26572	27768	28288	29848	29744	31772	31824	34788	34268
519	Machinery maintenance occupations	25428	26156	26624	27352	29120	29588	30524	31512	33748	34840
	Electrical and electronic equipment repairers	31200	31304	31876	32500	34788	32656	35204	36556	36920	39520
523	Electronic repairers, communications and industrial equipment	24856	26884	27924	30472	31668	30420	30680	32760	31772	35984
525	Data processing equipment repairers	31460	30628	31200	31252	30576	32240	34164	36764	35984	38636
526	Household appliance and power tool repairers	31200	31304	31876	32500	29120	29588	30524	31512	33748	39520
527	Telephone line installers and repairers	33280	31304	31876	35204	38792	37492	39624	39520	33748	50752
529	Telephone installers and repairers	34112	34060	36192	36504	29120	29588	30524	39572	40352	41756
533	Miscellaneous electrical and electronic equipment repairers	32500	32240	30004	31408	37076	34632	32708	36088	33748	39520
534	Heating, air conditioning, and refrigeration mechanics	24648	25584	25636	26156	28288	27716	30888	30108	32344	37076
	Miscellaneous mechanics and repairers	25376	25948	26416	27092	29588	30056	30576	31824	32968	33124
535	Camera, watch, and musical instrument repairers	25376	25948	26416	27092	29120	29588	30524	31512	33748	33124
536	Locksmiths and safe repairers	25376	25948	26416	27092	29120	29588	30524	31512	33748	33124

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
538	Office machine repairers	24700	24492	24024	29380	29120	28496	31096	31512	33748	33124
539	Mechanical controls and valve repairers	25376	25948	26416	27092	29120	29588	30524	31512	33748	33124
543	Elevator installers and repairers	25376	25948	26416	27092	29120	29588	30524	31512	33748	33124
544	Millwrights	31200	32708	36920	31408	34580	36088	37128	36400	40716	43004
547	Specified mechanics and repairers, n.e.c.	23192	25064	25532	26260	29120	29588	30524	31512	33748	33124
549	Not specified mechanics and repairers	24908	23920	24284	25740	29120	29588	30524	31512	33748	33124
	Construction trades	25740	25740	25584	26364	26936	27976	28340	29692	31148	31876
	Supervisors, construction occupations	32396	32968	32396	31564	34684	34424	36868	37544	38740	38948
553	Supervisors, brickmasons, stonemasons, and tile setters	32396	32968	32396	31564	26936	27976	28340	29692	31148	38948
554	Supervisors, carpenters and related workers	32396	32968	32396	31564	26936	27976	28340	29692	31148	38948
555	Supervisors, electricians and power transmission installers	32396	32968	32396	31564	26936	27976	28340	29692	31148	38948
556	Supervisors, painters, paperhangers, and plasterers	32396	32968	32396	31564	26936	27976	28340	29692	31148	38948
557	Supervisors, plumbers, pipefitters, and steamfitters	32396	32968	32396	31564	26936	27976	28340	29692	31148	38948
558	Supervisors, n.e.c.	31876	32448	31772	31252	26936	27976	28340	29692	31148	38948
	Construction trades, except supervisors	25012	24856	24752	25740	26156	27144	27144	28340	30108	30940
563	Brickmasons and stonemasons	25064	25012	25272	25168	25116	26832	29796	29328	29224	28652
564	Brickmason and stonemason apprentices	25012	24856	24752	25740	25116	26832	27144	29328	30108	28652
565	Tile setters, hard and soft	25012	24856	24752	25740	25116	26832	27144	23036	30108	27560
566	Carpet installers	19604	24856	21424	17888	20904	26728	24752	26364	25636	25844
567	Carpenters	22256	22828	22100	24336	24752	25064	25532	26936	27716	29952
569	Carpenters apprentices	22256	22828	22100	24336	26156	27144	27144	28340	30108	29952
573	Drywall installers	21996	20800	22100	23608	22672	22724	25792	25272	24752	27144
575	Electricians	28652	28548	29900	31044	31824	32500	33384	33852	36036	37232
576	Electrician apprentices	25012	24856	24752	25740	26156	27144	27144	28340	30108	30940
577	Electrical power installers and repairers	33540	36244	38064	38012	36920	42484	41340	37960	41860	39884
579	Painters, construction and maintenance	20072	20852	19968	20696	20384	19968	21112	22464	25168	23920
583	Paperhangers	25012	24856	24752	25740	26156	27144	27144	28340	30108	30940
584	Plasterers	25012	24856	24752	25740	26156	27144	27144	28340	30108	30940
585	Plumbers, pipefitters, and steamfitters	26936	27092	27612	28964	30472	31616	30940	30992	33488	35048
587	Plumber, pipefitter, and steamfitter apprentices	26936	27092	27612	28964	30472	31616	27144	28340	30108	35048
588	Concrete and terrazzo finishers	25012	21788	21216	22048	23972	27352	25116	26052	28392	28444
589	Glaziers	25012	24856	24752	25740	26156	27144	27144	28340	30108	30940
593	Insulation workers	23348	24856	24596	22360	26416	26988	27144	28340	30108	28444
594	Paving, surfacing, and tamping equipment operators	25012	24856	24752	25740	26156	27144	27144	28340	30108	30940

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

Occupation		Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
595	Roofers	21632	17420	19292	20176	18876	21164	23036	24388	24804	
596	Sheet metal duct installers	25012	24856	24752	25740	26156	27144	27144	28340	30108	30940
597	Structural metalworkers	25012	24856	24752	35516	31200	36868	30316	32968	37232	36348
598	Drillers, earth	25012	24856	24752	25740	26156	27144	27144	28340	30108	30940
599	Construction trades, n.e.c.	21320	20852	21684	22932	26156	27144	27144	28340	30108	30940
	Extractive occupations	33072	33384	34008	35360	36400	34476	32812	37284	41652	41028
613	Supervisors, extractive occupations	33072	33384	34008	35360	36400	34476	32812	37284	41652	41028
614	Drillers, oil well	33072	33384	34008	35360	36400	34476	32812	37284	41652	41028
615	Explosives workers	33072	33384	34008	35360	36400	34476	32812	37284	41652	41028
616	Mining machine operators	33072	33384	34008	35360	36400	34476	32812	37284	41652	41028
617	Mining occupations, n.e.c.	33072	33384	34008	35360	36400	34476	32812	37284	41652	41028
	Precision production occupations	27040	27612	28496	29484	30316	30368	31772	32760	33540	35360
628	Supervisors, production occupations	31512	31200	31772	32500	33800	34684	35672	36608	37752	38064
	Precision metalworking occupations	27040	28236	29120	30056	30940	31044	32292	33592	34580	36244
634	Tool and die makers	33436	32760	34632	36400	37128	40976	40872	41184	42484	42484
635	Tool and die maker apprentices	33436	32760	34632	36400	30940	31044	32292	33592	34580	36244
636	Precision assemblers, metal	27040	28236	29120	30056	30940	31044	32292	33592	34580	36244
637	Machinists	26052	26936	27248	28184	28860	30004	31252	31720	32916	35360
639	Machinist apprentices	26052	26936	27248	28184	30940	31044	32292	33592	34580	35360
643	Boilermakers	26052	26936	27248	28184	30940	31044	32292	33592	34580	36244
644	Precision grinders, filers, and tool sharpeners	26052	26936	27248	28184	30940	31044	32292	33592	34580	36244
645	Patternmakers and model makers, metal	26052	26936	27248	28184	30940	31044	32292	33592	34580	36244
646	Lay-out workers	26052	26936	27248	28184	30940	31044	32292	33592	34580	36244
647	Precious stones and metals workers (jewelers)	26052	26936	27248	28184	30940	31044	32292	33592	34580	36244
649	Engravers metal	26052	26936	27248	28184	30940	31044	32292	33592	34580	36244
653	Sheet metal workers	25428	28392	29588	27248	31824	28756	30732	33020	35204	34996
654	Sheet metal worker apprentices	26052	26936	27248	28184	30940	31044	32292	33592	34580	34996
655	Miscellaneous precision metalworkers	26052	26936	27248	28184	30940	31044	32292	33592	34580	36244
	Precision woodworking occupations	20176	18720	20592	21008	21268	20280	26364	25012	24596	27924
656	Patternmakers and model makers, wood	20176	18720	20592	21008	21268	20280	26364	25012	24596	27924
657	Cabinet makers and bench carpenters	20176	18720	20592	21008	21164	20488	28704	24180	24856	29016
658	Furniture and wood finishers	20176	18720	20592	21008	21268	20280	26364	25012	24596	27924
659	Miscellaneous precision woodworkers	20176	18720	20592	21008	21268	20280	26364	25012	24596	27924

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Precision textile, apparel, and furnishings machine workers	17576	16796	19240	18876	20280	18408	20488	21892	22308	35360
666	Dressmakers	17576	16796	19240	18876	20280	18408	20488	21892	22308	35360
667	Tailors	17576	16796	19240	18876	20280	18408	20488	21892	22308	35360
668	Upholsterers	17576	16796	19240	18876	20280	18408	20488	21892	22308	35360
669	Shoe repairers	17576	16796	19240	18876	20280	18408	20488	21892	22308	35360
674	Miscellaneous precision apparel and fabric workers	17576	16796	19240	18876	20280	18408	20488	21892	22308	35360
	Precision workers, assorted materials	21372	21892	20280	22204	21424	22568	26052	26676	25636	26884
675	Hand molders and shapers, except jewelers	21372	21892	20280	22204	21424	22568	26052	26676	25636	26884
676	Patternmakers, lay-out workers, and cutters	21372	21892	20280	22204	21424	22568	26052	26676	25636	26884
677	Optical goods workers	21372	21892	20280	22204	21424	22568	26052	26676	25636	26884
678	Dental laboratory and medical appliance technicians	21372	21892	20280	22204	21424	22568	26052	26676	25636	26884
679	Bookbinders	21372	21892	20280	22204	21424	22568	26052	26676	25636	26884
683	Electrical and electronic equipment assemblers	19552	19864	18252	20540	18460	20072	24544	24752	22828	26312
684	Miscellaneous precision workers, n.e.c.	21372	21892	20280	22204	21424	22568	26052	26676	25636	26884
	Precision food production occupations	17940	20436	19604	19604	20384	21372	21944	22880	22932	24544
686	Butchers and meat cutters	18148	20228	19708	19396	20904	21580	23712	22256	23712	24492
687	Bakers	16484	20436	18356	18564	18044	19708	19500	24700	22152	23972
688	Food batchmakers	17940	20436	19604	19604	20384	21372	21944	22880	22932	24544
	Precision inspectors, testers, and related workers	28028	30472	30992	31096	31356	33748	35152	34164	39624	39520
689	Inspectors, testers, and graders	27820	30004	31252	30836	31252	33956	35360	34008	39936	39676
693	Adjusters and calibrators	28028	30472	30992	31096	20384	21372	21944	22880	39624	24544
	Plant and system operators	31980	31668	31720	32604	33176	33592	36556	35828	37492	41028
694	Water and sewage treatment plant operators	26468	26104	27196	25896	29224	30004	31200	33020	32344	38792
695	Power plant operators	31980	31668	31720	32604	20384	21372	21944	22880	37492	41028
696	Stationary engineers	32032	30472	30784	31564	32240	32500	37336	32240	39000	40976
699	Miscellaneous plant and system operators	31980	31668	31720	32604	20384	21372	21944	22880	37492	41028
	Operators, fabricators, and laborers	20436	20748	21112	21476	21944	22672	23712	24544	25324	26052
J	Machine operators, assemblers and inspectors	21112	21164	21580	21892	22724	23348	24544	25324	25740	26624
	Machine operators and tenders, except precision	20696	20644	21320	21736	22204	22776	23972	25012	25532	26468
	Metalworking and plastic working machine operators	22412	22100	23504	23868	22724	23348	24544	25324	25740	28808
703	Lathe and turning machine set-up operators	22412	22100	23504	23868	22724	23348	24544	25324	25740	28808
704	Lathe and turning machine operators	22412	22100	23504	23868	22724	23348	24544	25324	25740	28808
705	Milling and planing machine operators	22412	22100	23504	23868	22724	23348	24544	25324	25740	28808
706	Punching and stamping press machine operators	20280	21320	21736	21320	23296	24700	22880	26260	25012	27300

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male 1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
707	Rolling machine operators	22412	22100	23504	23868	22724	23348	24544	25324	25740	28808
708	Drilling and boring machine operators	22412	22100	23504	23868	22724	23348	24544	25324	25740	28808
709	Grinding, abrading, buffing, and polishing machine operators	22204	20124	22308	20852	22256	22308	23556	26364	23816	26832
713	Forging machine operators	22412	22100	23504	23868	22724	23348	24544	25324	25740	28808
714	Numerical control machine operators	22412	22100	23504	23868	22724	23348	24544	25324	25740	28808
715	Miscellaneous metal, plastic, stone, and glass working machine operators	22412	22100	23504	23868	22724	23348	24544	25324	25740	28808
717	Fabricating machine operators, n.e.c.	20696	20644	21320	21736	22724	23348	24544	25324	25740	28808
	Metal and plastic processing machine operators	20124	20956	21060	21320	21632	22516	24336	24492	25012	27092
719	Molding and casting machine operators	19760	21060	20332	22152	21268	21424	23296	24596	26312	26572
723	Metal plating machine operators	20124	20956	21060	21320	21632	22516	24336	24492	25012	27092
724	Heat treating equipment operators	20124	20956	21060	21320	21632	22516	24336	24492	25012	27092
725	Miscellaneous metal and plastic processing machine operators	20124	20956	21060	21320	21632	22516	24336	24492	25012	27092
	Woodworking machine operators	15964	17472	16588	16848	20124	17940	20488	20696	22308	22412
726	Wood lathe, routing, and planing machine operators	15964	17472	16588	16848	20124	17940	20488	20696	22308	22412
727	Sawing machine operators	15184	17420	16692	16276	19136	16848	19500	20436	22256	22412
728	Shaping and joining machine operators	15964	17472	16588	16848	20124	17940	20488	20696	22308	22412
729	Nailing and tacking machine operators	15964	17472	16588	16848	20124	17940	20488	20696	22308	22412
733	Miscellaneous woodworking machine operators	15964	17472	16588	16848	20124	17940	20488	20696	22308	22412
	Printing machine operators	24128	24388	24440	25584	26000	26832	27716	27352	30628	32136
734	Printing press operators	23660	23816	24388	25792	26104	26052	26728	26676	30680	31564
735	Photoengravers and lithographers	24128	24388	24440	25584	26000	26832	27716	27352	30628	32136
736	Typesetters and compositors	24128	24388	24440	25584	26000	26832	27716	27352	30628	32136
737	Miscellaneous printing machine operators	24128	24388	24440	25584	26000	26832	27716	27352	30628	32136
	Textile, apparel, and furnishings machine operators	14716	15184	15496	16016	16120	16328	16536	18096	19708	19396
738	Winding and twisting machine operators	14716	15184	15496	16016	16120	16328	16536	18096	19708	19396
739	Knitting, looping, taping, and weaving machine operators	14716	15184	15496	16016	16120	16328	16536	18096	19708	19396
743	Textile cutting machine operators	14716	15184	15496	16016	16120	16328	16536	18096	19708	19396
744	Textile sewing machine operators	12220	13104	13780	15028	14924	14768	15600	16952	16380	17940
745	Shoe machine operators	14716	15184	15496	16016	16120	16328	16536	18096	19708	19396
747	Pressing machine operators	14716	15340	15496	16016	16120	16328	16536	18096	19708	19396
748	Laundering and dry cleaning machine operators	14716	14612	14040	16016	16120	16744	15652	25324	20592	19396
749	Miscellaneous textile machine operators	14716	15184	15496	16016	16120	16328	16536	18096	19708	19396

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Machine operators, assorted materials	21164	20956	21788	22256	22464	23660	24180	25324	25740	26416
753	Cementing and gluing machine operators	21164	20956	21788	22256	22464	23660	24180	25324	25740	26416
754	Packaging and filling machine operators	16172	16120	17264	16640	17888	19812	18616	21632	21008	23192
755	Extruding and forming machine operators	21164	20956	21788	22256	22464	23660	24180	25324	25740	26416
756	Mixing and blending machine operators	22204	21684	22048	22880	20540	25324	23868	25844	27092	29068
757	Separating, filtering, and clarifying machine operators	28912	20956	33384	22256	31616	35776	24544	34164	37752	26416
758	Compressing and compacting machine operators	21164	20956	21788	22256	22464	23660	24180	25324	25740	26416
759	Painting and paint spraying machine operators	20228	20332	20904	23244	22932	23244	21944	24960	25064	26416
763	Roasting and baking machine operators, food	21164	20956	21788	22256	22464	23660	24180	25324	25740	26416
764	Washing, cleaning, and pickling machine operators	21164	20956	21788	22256	22464	23660	24180	25324	25740	26416
765	Folding machine operators	21164	20956	21788	22256	22464	23660	24180	25324	25740	26416
766	Furnace, kiln, and oven operators, except food	25012	26156	26104	25792	26624	29484	29016	31044	26000	32760
768	Crushing and grinding machine operators	21164	20956	21788	22256	22464	23660	24180	25324	25740	26416
769	Slicing and cutting machine operators	19344	18616	19396	20332	21164	20592	23140	24596	22360	25480
773	Motion picture projectionists	21164	20956	21788	22256	22464	23660	24180	25324	25740	26416
774	Photographic process machine operators	21164	20956	21788	22256	22464	23660	24180	25324	25740	26416
777	Miscellaneous machine operators, n.e.c.	21736	21528	22932	23036	22464	23660	24180	25324	25740	26416
779	Machine operators, not specified	21268	21268	21372	22048	22464	23660	24180	25324	25740	26416
	Fabricators, assemblers, and hand working occupations	21268	21632	21476	21684	23296	23452	25064	25740	25636	26260
783	Welders and cutters	23088	23764	24180	24388	25064	25792	27404	27300	27196	28392
784	Solderers and brazers	21268	21632	21476	21684	23296	23452	25064	25740	25636	26260
785	Assemblers	19604	20228	19812	20592	22360	21580	23140	24076	24180	25012
786	Hand cutting and trimming occupations	21268	21632	21476	21684	23296	23452	25064	25740	25636	26260
787	Hand molding, casting, and forming occupations	21268	21632	21476	21684	23296	23452	25064	25740	25636	26260
789	Hand painting, coating, and decorating occupations	21268	21632	21476	21684	23296	23452	25064	25740	25636	26260
793	Hand engraving and printing occupations	21268	21632	21476	21684	23296	23452	25064	25740	25636	26260
795	Miscellaneous hand working occupations	21268	21632	21476	21684	23296	23452	25064	25740	25636	26260
	Production inspectors, testers, samplers, and weighers	24752	23920	24388	25012	24492	26936	26884	26312	28704	30784
796	Production inspectors, checkers, and examiners	25376	25740	25220	26416	25948	29432	28288	27560	30784	32032
797	Production testers	24752	23920	24388	25012	24492	26936	26884	26312	28704	30784
798	Production samplers and weighers	24752	23920	24388	25012	24492	26936	26884	26312	28704	30784
799	Graders and sorters, except agricultural	24752	14924	16276	14768	14508	14768	18252	18044	18564	20176

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
K	Transportation and material moving occupations	22672	23712	24388	25064	25272	26260	26988	27144	29016	30524
	Motor vehicle operators	21996	23192	24076	25064	25168	26208	26728	27248	29328	30732
803	Supervisors motor vehicle operators	26312	31148	27196	30264	32968	32240	32500	32292	38480	35516
804	Truck drivers	21892	23348	24492	25168	25220	26468	27040	27664	29796	31200
806	Driver-sales workers	25844	25220	24544	27092	26780	28860	28808	28860	30264	33644
808	Bus drivers	24336	22932	21788	25844	24336	24752	24752	25896	26312	25324
809	Taxicab drivers and chauffeurs	16640	16588	20228	18824	19812	21060	20072	22932	24960	26468
813	Parking lot attendants	21996	23192	24076	25064	25168	26208	26728	27248	29328	30732
814	Motor transportation occupations, n.e.c.	21996	23192	24076	25064	25168	26208	26728	27248	29328	30732
	Transportation occupations, except motor vehicle	36452	37492	32812	36972	36192	40092	44824	40144	42692	47788
	Rail transportation occupations	37440	38168	36712	38272	38584	42588	46176	42640	45916	49400
823	Railroad conductors and yardmasters	37440	38168	36712	38272	36192	40092	44824	40144	42692	49400
824	Locomotive operating occupations	37440	38168	36712	38272	36192	40092	44824	40144	48152	49400
825	Railroad brake, signal, and switch operators	37440	38168	36712	38272	36192	40092	44824	40144	42692	49400
826	Rail vehicle operators, n.e.c.	37440	38168	36712	38272	36192	40092	44824	40144	42692	49400
	Water transportation occupations	36452	35256	30108	32500	30784	40092	44824	40144	40768	47788
828	Ship captains and mates, except fishing boats	36452	35256	30108	32500	36192	40092	44824	40144	40768	47788
829	Sailors and deckhands	36452	35256	30108	32500	36192	40092	44824	40144	40768	47788
833	Marine engineers	36452	35256	30108	32500	36192	40092	44824	40144	40768	47788
834	Bridge, lock, and lighthouse tenders	36452	35256	30108	32500	36192	40092	44824	40144	40768	47788
	Material moving equipment operators	22568	23296	23816	23816	24388	25324	26520	26156	26832	28080
843	Supervisors, material moving equipment operators	22568	23296	23816	23816	24388	25324	26520	26156	26832	28080
844	Operating engineers	26728	26260	27456	26520	26936	30680	29536	30108	31980	35100
845	Longshore equipment operators	22568	23296	23816	23816	24388	25324	26520	26156	26832	28080
848	Hoist and winch operators	22568	23296	23816	23816	24388	25324	26520	26156	26832	28080
849	Crane and tower operators	29432	28600	27872	29068	29016	31148	29744	30472	34684	37336
853	Excavating and loading machine operators	22672	22672	23452	26364	25324	26884	29016	30004	30212	34372
855	Grader, dozer, and scraper operators	22984	21840	25116	26000	24388	25220	30056	24804	26832	29692
856	Industrial truck and tractor equipment operators	19448	20488	21944	20228	21840	21684	23660	23452	23556	24752
859	Miscellaneous material moving equipment operators	22568	23296	25064	24804	24388	25324	26520	26156	26832	28080

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
L	Handlers, equipment cleaners, helpers, and laborers	16328	16588	16588	17056	17836	17836	18824	19604	20488	20852
864	Supervisors, handlers, equipment cleaners, and laborers, n.e.c.	16328	16588	16588	17056	17836	17836	18824	19604	20488	20852
865	Helpers, mechanics and repairers	16328	16588	16588	17056	17836	17836	18824	19604	20488	20852
**	Helpers, construction and extractive occupations	14716	15184	16588	15340	16016	16536	17680	17160	20488	20332
866	Helpers, construction trades	14456	15028	14508	15184	15860	16640	17368	17420	19292	20072
867	Helpers, surveyor	14456	15028	14456	15184	16016	16536	17680	17160	20488	20332
868	Helpers, extractive occupations	14456	15028	14508	15184	16016	16536	17680	17160	20488	20332
869	Construction laborers	18044	19656	17576	18564	19604	19552	20436	21476	23140	22204
874	Production helpers	16328	16588	19552	17056	17836	17836	18824	19604	20592	20852
	Freight, stock, and material handlers	16328	16432	16744	16900	17680	17628	18200	19500	19812	20696
875	Garbage collectors	16328	16432	16744	16900	17680	17628	18200	19500	19812	20696
876	Stevedores	16328	16432	16744	16900	17680	17628	18200	19500	19812	20696
877	Stock handlers and baggers	13780	14404	14092	14508	15184	15236	15808	16640	17628	17160
878	Machine feeders and offbearers	16432	16432	17628	16900	17680	17628	18200	19500	23972	20696
883	Freight, stock, and material handlers, n.e.c.	18460	17836	19448	18824	17680	17628	18200	19500	19812	20696
885	Garage and service station related occupations	13000	12792	13468	14404	14300	14248	15444	16276	16848	17056
887	Vehicle washers and equipment cleaners	13832	13728	14560	14144	15392	15860	16744	16380	18044	17992
888	Hand packers and packagers	14456	14508	15132	15496	16432	17004	15964	17576	17212	17888
889	Laborers, except construction	17108	17212	17316	18044	18720	18616	19968	20436	21164	21320
H	Farming, forestry, and fishing occupations	13988	14248	15080	15288	15600	15704	15964	17732	18044	19032
	Farm operators and managers	13988	14248	15080	21632	23972	22516	24700	27300	30056	29120
473	Farmers, except horticultural	13988	14248	15080	21632	23972	22516	24700	27300	30056	29120
474	Horticulture specialty farmers	13988	14248	15080	21632	23972	22516	24700	27300	30056	29120
	Farm managers	13988	14248	15080	21632	27040	23192	25272	28236	30056	29120
475	Managers, farm, except horticultural	13988	14248	15080	21632	23972	22516	24700	27300	30056	29120
476	Managers, horticultural specialty farms	13988	14248	15080	21632	23972	22516	24700	27300	30056	29120
	Other agricultural and related occupations	13676	13884	14820	14820	15132	15340	15756	17108	17524	18356
	Farm occupations, except managerial	12636	13052	13780	14040	14456	14560	14976	16484	16432	17056
477	Supervisors, farm workers	12636	13052	13780	14040	15132	15340	15756	17108	17524	18356
479	Farm workers	12376	12896	13416	13832	14092	14352	14820	16172	16276	16588
483	Marine life cultivation workers	12636	13052	13780	14040	15132	15340	15756	17108	17524	18356
484	Nursery workers	12636	13052	13780	14040	15132	15340	15756	17108	17524	18356

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Male									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Related agricultural occupations	14768	14716	15704	15548	15756	16068	16328	17784	18772	19240
485	Supervisors, related agricultural occupations	21580	20852	21580	22048	21736	21944	24908	28028	29328	32500
486	Groundskeepers and gardeners, except farm	14352	14196	15080	14872	15288	15600	15912	16744	17836	18616
487	Animal caretakers, except farm	14768	14716	15704	15548	15132	15340	15756	17108	17524	19240
488	Graders and sorters, agricultural products	14768	14716	15704	15548	15132	15340	15756	17108	17524	19240
489	Inspectors, agricultural products	14768	14716	15704	15548	15132	15340	15756	17108	17524	19240
	Forestry and logging occupations	15600	18876	19032	20592	22880	21112	15756	26416	25324	18356
494	Supervisors, forestry and logging occupations	15600	18876	19032	20592	15132	15340	15756	17108	17524	18356
495	Forestry workers, except logging	15600	18876	19032	20592	15132	15340	15756	17108	17524	18356
496	Timber cutting and logging occupations	15600	18668	19032	20904	15132	20384	15756	17108	17524	18356
	Fishers, hunters, and trappers	13988	14248	15080	15288	15132	15340	15756	17108	17524	18356
497	Captains and other officers, fishing vessels	13988	14248	15080	15288	15132	15340	15756	17108	17524	18356
498	Fishers	13988	14248	15080	15288	15132	15340	15756	17108	17524	18356
499	Hunters and trappers	13988	14248	15080	15288	15132	15340	15756	17108	17524	18356

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Total	19812	20540	20748	21112	21736	22412	23712	24596	25532	26572
	Managerial and professional specialty occupations	29224	30160	30784	31460	32032	32864	34060	35412	36868	38064
A	Executive, administrative, and managerial occupations	26988	27456	28132	29640	30420	31460	32552	33904	35672	36712
003	Legislators	26988	27456	28132	29640	30420	31460	32552	33904	35672	36712
004	Chief executives, and general administrators, public administration	26988	27456	28132	29640	30420	31460	32552	33904	35672	36712
005	Administrators and officials, public administration	31252	31616	32760	33904	33176	33956	34476	37700	38480	38844
006	Administrators, protective services	26988	27456	28132	29640	30420	31460	32552	33904	35672	36712
007	Financial managers	31876	32864	31096	33020	33020	34320	36556	36556	40924	42432
008	Personnel and labor relations managers	30680	26884	29692	33592	34216	35932	38844	38584	43524	44772
009	Purchasing managers	26988	27456	28132	29640	34268	31460	37648	36348	35672	38948
013	Managers, marketing, advertising, and public relations	32604	33124	32812	32812	35048	38272	39468	41600	43992	44356
014	Administrators, education and related fields	35204	33020	32968	35048	34164	34424	37960	42588	43004	42588
015	Managers, medicine and health	34944	32188	30212	30160	31720	32864	35308	37128	35152	37700
016	Postmasters and mail superintendents	26988	27456	28132	29640	30420	31460	32552	33904	35672	36712
017	Managers, food service and lodging establishments	18876	19084	19500	19552	20332	21164	22568	23972	24700	25272
018	Managers, properties and real estate	24804	23348	19968	24128	25012	26572	26936	30056	29380	32240
019	Funeral directors	26988	27456	28132	29640	30420	31460	32552	33904	35672	36712
021	Managers, service organizations, n.e.c.	27248	26572	26260	27196	30420	31460	32552	33904	35672	36712
022	Managers and administrators, n.e.c.	26416	28444	30368	30940	30420	31460	32552	33904	35672	36712
	Management-related occupations	26364	26884	27248	28496	29484	30160	31304	32760	34268	34840
023	Accountants and auditors	26936	28288	28340	28496	29172	30680	32136	33852	35880	35724
**	Underwriters and other financial officers	26208	26884	27248	28496	29484	30160	31304	32760	34268	34840
024	Underwriters	26624	27976	26416	29172	30576	32188	32500	33956	36608	38064
025	Other financial officers	26728	28600	27612	30472	31512	30212	30732	31980	34268	37024
026	Management analysts	26364	26884	38324	28496	37232	39520	39104	41080	42588	50388
027	Personnel, training, and labor relations specialists	29120	27768	30160	30212	31044	30836	31252	33956	35256	34840
028	Purchasing agents and buyers, farm products	26364	26884	27248	28496	29484	30160	31304	32760	34268	34840
029	Buyers, wholesale and retail trade, except farm products	23608	23140	25272	25012	24856	26000	30680	30576	29588	30472
033	Purchasing agents and buyers, n.e.c.	24596	24700	27144	26884	29484	30160	31304	32760	34268	34840
034	Business and promotion agents	26364	26884	27248	28496	29484	30160	31304	32760	34268	34840
035	Construction inspectors	26364	26884	27248	28496	29484	30160	31304	32760	34268	34840
036	Inspectors and compliance officers, except construction	26364	26884	30056	32760	31512	35100	37128	36764	38168	38948
037	Management-related occupations, n.e.c.	24336	24492	25428	26052	29484	30160	31304	32760	34268	34840

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
B	Professional specialty occupations	30524	31460	32396	32864	33644	34424	35464	36764	37700	38948
	Engineers, architects, and surveyors	38584	41496	39676	40456	40924	42224	43004	47164	48776	51428
043	Architects	38584	41496	39676	40456	40924	42224	43004	47164	48776	51428
	Engineers	39104	43108	40820	41912	41236	43524	43212	48516	49348	53144
044	Aerospace engineers	39104	43108	40820	41912	41236	43524	43212	48516	49348	53144
045	Metallurgical and materials engineers	39104	43108	40820	41912	41236	43524	43212	48516	49348	53144
046	Mining engineers	39104	43108	40820	41912	41236	43524	43212	48516	49348	53144
047	Petroleum engineers	39104	43108	40820	41912	41236	43524	43212	48516	49348	53144
048	Chemical engineers	39104	43108	40820	41912	41236	43524	43212	48516	49348	53144
049	Nuclear engineers	39104	43108	40820	41912	41236	43524	43212	48516	49348	53144
053	Civil engineers	39104	43108	40820	41912	41236	43524	43212	48516	49348	53144
054	Agricultural engineers	39104	43108	40820	41912	41236	43524	43212	48516	49348	53144
055	Electrical and electronic engineers	39104	43108	40820	41912	41236	45240	48412	49712	57408	62400
056	Industrial engineers	39104	43108	40820	41912	41236	43524	43212	48516	49348	53144
057	Mechanical engineers	39104	43108	40820	41912	41236	43524	43212	48516	49348	53144
058	Marine engineers and naval architects	39104	43108	40820	41912	41236	43524	43212	48516	49348	53144
059	Engineers, n.e.c.	39104	43108	40820	41912	41236	43524	43212	48516	49348	53144
063	Surveyors and mapping scientists	38584	41496	39676	40456	41236	43524	43212	48516	49348	51428
	Mathematical and computer scientists	37024	37648	38376	39208	41080	43784	44668	45552	46852	46696
064	Computer systems analysts and scientists	37960	39832	39572	40716	42276	44200	46280	47164	47944	47736
065	Operations and systems researchers and analysts	35724	34060	35932	36296	38324	42952	39000	40612	42484	42588
066	Actuaries	37024	37648	38376	39208	41080	43784	44668	45552	46852	46696
067	Statisticians	37024	37648	38376	39208	41080	43784	44668	45552	46852	46696
068	Mathematical scientists, n.e.c.	37024	37648	38376	39208	41080	43784	44668	45552	46852	46696
	Natural scientists	32344	34112	34476	34476	35048	34736	38064	38012	37752	39416
069	Physicists and astronomers	32344	34112	34476	34476	35048	34736	38064	38012	37752	39416
073	Chemists, except biochemists	32344	34112	37336	39312	35048	34736	38064	38012	37752	41600
074	Atmospheric and space scientists	32344	34112	34476	34476	35048	34736	38064	38012	37752	39416
075	Geologists and geodesists	32344	34112	34476	34476	35048	34736	38064	38012	37752	39416
076	Physical scientists, n.e.c.	32344	34112	34476	34476	35048	34736	38064	38012	37752	39416
077	Agricultural and food scientists	32344	34112	34476	34476	35048	34736	38064	38012	37752	39416
078	Biological and life scientists	32344	34112	34476	34476	35048	34736	38064	38012	37752	39416

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
079	Forestry and conservation scientists	32344	34112	34476	34476	35048	34736	38064	38012	37752	39416
083	Medical scientists	32344	34112	34476	34476	35048	34736	38064	38012	37752	39416
	Health diagnosing occupations	38948	42640	40716	39832	39676	48308	49296	46176	48880	45916
084	Physicians	44668	46020	42380	41912	41704	49192	50232	44304	46748	49816
085	Dentists	38948	42640	40716	39832	39676	48308	49296	46176	48880	49816
086	Veterinarians	38948	42640	40716	39832	39676	48308	49296	46176	48880	49816
087	Optometrists	38948	42640	40716	39832	39676	48308	49296	46176	48880	49816
088	Podiatrists	38948	42640	40716	39832	39676	48308	49296	46176	48880	49816
089	Health diagnosing practitioners, n.e.c.	38948	42640	40716	39832	39676	48308	49296	46176	48880	49816
	Health assessment and treating occupations	34216	35360	34840	35776	35984	36452	37960	38792	40456	42172
095	Registered nurses	34476	35776	35360	36036	36140	36660	38168	38844	40664	42640
096	Pharmacists	42016	45968	34840	35776	48412	47164	51220	57460	59904	65572
097	Dietitians	23764	25584	28548	25272	25168	29796	37960	38792	31668	28340
	Therapists	33228	32708	32760	34580	35256	35672	36868	36764	37804	40664
098	Respiratory therapists	33228	32708	32760	34580	35256	35672	36868	36764	37804	40664
099	Occupational therapists	33228	32708	32760	34580	35256	35672	36868	36764	37804	40664
103	Physical therapists	36140	36192	32760	40820	35256	35672	46124	42016	37804	41912
104	Speech therapists	33228	32708	35724	37752	35984	37804	37908	40040	40248	43472
105	Therapists, n.e.c.	33228	32708	32760	34580	35256	35672	36868	36764	37804	40664
106	Physicians' assistants	34216	35360	34840	35776	35984	36452	37960	38792	37804	42172
	Teachers, college and university	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
113	Earth, environmental and marine science teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
114	Biological science teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
115	Chemistry teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
116	Physics teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
117	Natural science teachers, n.e.c.	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
118	Psychology teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
119	Economics teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
123	History teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
124	Political science teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
125	Sociology teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
126	Social science teachers, n.e.c.	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
127	Engineering teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
128	Mathematical science teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
129	Computer science teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
133	Medical science teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
134	Health specialties teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
135	Business, commerce, and marketing teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
136	Agriculture and forestry teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
137	Art, drama, and music teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
138	Physical education teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
139	Education teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
143	English teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
144	Foreign language teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
145	Law teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
146	Social work teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
147	Theology teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
148	Trade and industrial teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
149	Home economics teachers	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
153	Teachers, postsecondary, n.e.c.	34996	35828	40092	38220	39780	43108	39988	44668	41860	43888
154	Postsecondary teachers, subject not specified	27612	35256	40040	38220	39780	43108	39988	44668	41860	43888
	Teachers, except postsecondary	27560	29120	31356	31252	31876	32916	33488	34268	34996	36764
155	Teachers, prekindergarten and kindergarten	18564	18044	19500	19292	18616	21060	20696	22984	23660	24752
156	Teachers, elementary school	28548	30472	32292	32604	33696	34060	35204	36244	36452	38012
157	Teachers, secondary school	30368	31200	34528	33124	33436	35828	36296	37544	38532	39468
158	Teachers, special education	28808	30524	32188	31876	33904	35048	36036	34528	34840	39728
159	Teachers, n.e.c.	25428	25428	24700	23504	18616	21060	20696	22984	23660	36764
163	Counselors, educational and vocational	28600	31148	32136	33488	34268	32708	35828	38584	39468	38168
	Librarians, archivists, and curators	30836	29380	30108	31044	33280	32656	33280	35568	34164	37076
164	Librarians	30888	29432	30524	30940	33748	32708	33956	35568	34164	37076
165	Archivists and curators	30836	29380	30108	31044	33644	34424	35464	36764	34164	37076

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Social scientists and urban planners	30420	32032	32032	31824	33384	32500	34372	35464	36816	39000
166	Economists	30420	32032	32032	34632	34008	36764	33956	40248	40820	38116
167	Psychologists	30680	32240	29484	30472	30628	28652	32292	32396	36296	39364
168	Sociologists	30420	32032	32032	31824	33384	32500	34372	35464	36816	39000
169	Social scientists, n.e.c.	30420	32032	32032	31824	33384	32500	34372	35464	36816	39000
173	Urban planners	30420	32032	32032	31824	33384	32500	34372	35464	36816	39000
	Social, recreation, and religious workers	23348	24440	24752	24908	25220	26104	27612	28964	30004	31928
174	Social workers	24388	25792	25844	25844	26364	26936	29536	30108	30628	32760
175	Recreation workers	23348	24440	14820	15756	16328	16484	18252	21684	20696	23452
176	Clergy	23348	24440	24752	24908	25220	26104	27612	28964	30004	31928
177	Religious workers, n.e.c.	23348	24440	24752	24908	25220	26104	27612	28964	30004	31928
	Lawyers and judges	45968	52676	47424	49088	50440	49504	49712	50492	54808	55224
178	Lawyers	47684	52780	47684	49816	50440	49868	49452	50648	54756	55796
179	Judges	45968	52676	47424	49088	50440	49504	49712	50492	54808	55224
	Writers, artists, entertainers, and athletes	25688	26364	26416	27144	27508	28964	30732	31460	33332	35516
183	Authors	25688	26364	26416	27144	27508	28964	30732	31460	33332	35516
184	Technical writers	25688	26364	26416	27144	27508	28964	30732	31460	33332	35516
185	Designers	24336	25220	23608	25480	22932	26728	29224	26624	31668	33228
186	Musicians and composers	25688	26364	26416	27144	27508	28964	30732	31460	33332	35516
187	Actors and directors	25688	26364	26416	27144	27508	28964	30732	31460	33332	35516
188	Painters, sculptors, craft artists, and artist printmakers	25688	26364	26416	27144	27508	28964	30732	31460	33332	35516
189	Photographers	25688	26364	26416	27144	27508	28964	30732	31460	33332	35516
193	Dancers	25688	26364	26416	27144	27508	28964	30732	31460	33332	35516
194	Artists, performers, and related workers, n.e.c.	25688	26364	26416	27144	27508	28964	30732	31460	33332	35516
195	Editors and reporters	27040	26208	30316	29172	31616	31512	32032	36868	37336	36660
197	Public relations specialists	29848	30056	27560	31460	30472	30576	35360	35568	34840	41028
198	Announcers	25688	26364	26416	27144	27508	28964	30732	31460	33332	35516
199	Athletes	25688	26364	26416	27144	27508	28964	30732	31460	33332	35516
	Technical, sales, and administrative support occupations	18980	19552	19552	19916	20488	20956	21788	22412	23504	24596
C	Technicians and related support occupations	22672	24336	24232	24960	25896	25896	26572	27456	28132	30160
	Health technologists and technicians	21580	22620	22880	23452	24440	24232	25272	25428	26364	27768
203	Clinical laboratory technologists and technicians	25636	26572	25792	26416	26416	27768	28548	30836	29744	29900
204	Dental hygienists	21580	22620	22880	23452	24440	24232	25272	25428	26364	27768
205	Health record technologists and technicians	21580	16692	22880	23452	24440	24232	25272	25428	26364	27768

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
206	Radiologic technicians	27456	28808	27196	29380	28964	29744	30940	30992	32656	36088
207	Licensed practical nurses	21372	22412	23244	23036	24232	24440	24440	25584	26728	29224
208	Health technologists and technicians, n.e.c.	19032	20072	19968	21008	24440	24232	25272	25428	26364	27768
	Technologists and technicians, except health	22672	24336	24232	24960	25896	25896	26572	27456	28132	30160
	Engineering and related technologists and technicians	24180	24596	23764	26988	28184	27508	27508	32500	30472	31616
213	Electrical and electronic technicians	24180	24596	23764	26988	28184	27508	28652	33748	31148	32656
214	Industrial engineering technicians	24180	24596	23764	26988	28184	27508	27508	32500	30472	31616
215	Mechanical engineering technicians	24180	24596	23764	26988	28184	27508	27508	32500	30472	31616
216	Engineering technicians, n.e.c.	23296	24596	21268	25168	28184	27508	27508	32500	30472	31616
217	Drafting occupations	24180	24596	23764	26988	28184	27508	27508	32500	31824	31616
218	Surveying and mapping technicians	24180	24596	23764	26988	28184	27508	27508	32500	30472	31616
	Science technicians	19500	23192	23504	22828	23036	24024	24076	24960	23920	29016
223	Biological technicians	19500	23192	23504	22828	23036	24024	23348	20176	23920	25532
224	Chemical technicians	19500	23192	23504	22828	23036	24024	24076	24960	23920	29016
225	Science technicians, n.e.c.	19500	23192	23504	22828	23036	24024	24076	24960	23920	29016
	Technicians, except health, engineering, and science	25376	29068	28548	30732	31772	31304	31668	32448	34060	36660
226	Airplane pilots and navigators	25376	29068	28548	30732	31772	31304	31668	32448	34060	36660
227	Air traffic controllers	25376	29068	28548	30732	31772	31304	31668	32448	34060	36660
228	Broadcast equipment operators	25376	29068	28548	30732	31772	31304	31668	32448	34060	36660
229	Computer programmers	31616	36088	36036	35412	38532	38584	37180	40976	45136	45084
233	Tool programmers, numerical control	25376	29068	28548	30732	31772	31304	31668	32448	34060	36660
234	Legal assistants	24596	27352	25064	26052	28340	28756	30212	30212	30992	33124
235	Technicians, n.e.c.	21892	22048	28548	30732	31772	31304	31668	32448	34060	36660
D	Sales occupations	16276	17108	16848	17160	18356	18304	19344	20748	21164	22308
243	Supervisors and proprietors	19240	20072	21008	20228	21580	22776	23348	23608	25220	26104
	Sales representatives, finance and business services	25272	26624	25220	25948	25220	26988	29432	30628	30732	32604
253	Insurance sales occupations	23504	26000	24128	23556	24492	25636	27768	28028	28652	30316
254	Real estate sales occupations	24908	30056	24908	26832	26520	27196	29900	30420	30420	36140
255	Securities and financial services sales occupations	27560	30992	26936	26312	28132	28600	31096	32032	33332	37232
256	Advertising and related sales occupations	24960	26364	25116	28912	21892	27508	30888	32552	35308	34476
257	Sales occupations, other business services	26104	24908	26364	26364	25272	27144	26832	31772	29900	28288
	Sales representatives, commodities, except retail	24596	26884	26780	29536	30316	30264	31356	31720	34580	36088
258	Sales engineers	24596	26884	26780	29536	30316	30264	31356	31720	34580	36088
259	Sales representatives, mining, manufacturing and wholesale	24596	26884	26780	29536	30316	30264	31356	31720	34580	36088

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Sales workers, retail and personal services	12116	12532	12584	13156	13468	13832	14144	15392	15652	16276
263	Sales workers, motor vehicles and boats	12116	12532	12584	13156	13468	13832	14144	15392	15652	16276
264	Sales workers, apparel	12376	12844	13416	13364	13520	14092	14716	14872	15652	17108
265	Sales workers, shoes	12116	12532	12584	13156	13468	13832	14144	15392	15652	16276
266	Sales workers, furniture and home furnishings	12116	12532	12584	13156	13468	21996	14144	25844	19188	16276
267	Sales workers, radio, tv, hi-fi, and appliances	12116	12532	12584	13156	13468	13832	14144	21476	15652	24180
268	Sales workers, hardware and building supplies	12116	12532	12584	13156	13468	13832	14144	15392	20540	22360
269	Sales workers, parts	12116	12532	12584	13156	13468	13832	14144	15392	15652	16276
274	Sales workers, other commodities	13104	13000	13832	14040	14196	14560	14924	16380	16588	18252
275	Sales counter clerks	11908	12532	11544	13364	13468	13936	13832	15756	18304	16120
276	Cashiers	11284	11492	11440	12116	12480	12896	13468	14300	14352	15184
277	Street and door-to-door sales workers	16900	19188	12584	19500	20696	17004	18460	20124	21892	25584
278	News vendors	12116	12532	12584	13156	13468	13832	14144	15392	15652	16276
	Sales-related occupations	16276	17108	16848	17160	18356	18304	19344	20748	21164	22308
283	Demonstrators, promoters and models, sales	16276	17108	16848	17160	18356	18304	19344	20748	21164	22308
284	Auctioneers	16276	17108	16848	17160	18356	18304	19344	20748	21164	22308
285	Sales support occupations, n.e.c.	16276	17108	16848	17160	18356	18304	19344	20748	21164	22308
E	Administrative support occupations, including clerical	18928	19500	19448	19968	20332	20956	21736	22204	23348	24388
	Supervisors, administrative support occupations	25740	26728	25324	25376	26312	27300	28912	29120	28340	30524
303	Supervisors, general office	25116	26208	24076	24492	26156	26676	28444	28028	27664	28704
304	Supervisors, computer equipment operators	25740	26728	25324	25376	26312	27300	28912	29120	28340	30524
305	Supervisors, financial records processing	28652	28496	28652	30004	29952	27768	30680	32344	30576	36556
306	Chief communications operators	25740	26728	25324	25376	26312	27300	28912	29120	28340	30524
307	Supervisors, distribution, scheduling, and adjusting clerks	26052	26728	25324	25948	26468	28964	28652	26572	28288	32708
	Computer equipment operators	19656	21112	18980	20436	20852	21944	24804	25220	25584	25896
308	Computer operators	19656	21216	19084	20384	20956	22256	24856	25220	25636	25948
309	Peripheral equipment operators	19656	21112	18980	20436	20852	21944	24804	25220	25584	25896
	Secretaries, stenographers, and typists	19240	20020	19812	20540	21008	21372	22672	23192	23660	24856
313	Secretaries	19396	20072	19916	20540	21112	21268	22360	23036	23400	24700
314	Stenographers	19396	23088	20644	20540	21008	23868	23712	25376	25792	26572
315	Typists	17888	19084	19136	20488	20644	21528	24388	23660	24284	25220
	Information clerks	16380	16900	16536	17472	17836	18668	18876	20072	20800	21528
316	Interviewers	17784	18356	18512	17628	18928	18512	20436	20592	22932	23296
317	Hotel clerks	12740	13624	14144	17472	13884	14196	16224	16016	17836	18044

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
318	Transportation ticket and reservation agents	20176	20800	20280	20332	20644	24856	22516	24128	22516	24700
319	Receptionists	16068	16380	16016	17004	17316	17992	18252	19396	20176	20852
323	Information clerks, n.e.c.	16016	17420	17628	17836	17836	18668	18876	20072	20800	21528
	Records processing occupations, except financial	18200	18928	20228	19760	19916	19604	21632	21892	23868	24388
325	Classified-ad clerks	18200	18928	20228	19760	19916	19604	21632	21892	23868	24388
326	Correspondence clerks	18200	18928	20228	19760	19916	19604	21632	21892	23868	24388
327	Order clerks	21528	23660	23608	23504	23452	24076	23400	23920	24856	27144
328	Personnel clerks, except payroll and timekeeping	18200	18928	24856	19760	19916	22412	25324	21892	26624	24388
329	Library clerks	18200	18928	20228	21112	19916	19604	18148	21892	23868	20696
335	File clerks	15288	16016	15912	17264	16900	17420	19084	18148	19864	20696
336	Records clerks	17992	19344	19916	19448	19916	20176	22672	21996	25272	24908
	Financial records processing occupations	18876	19500	19396	19864	20800	21684	22152	22620	24596	24908
337	Bookkeepers, accounting, and auditing clerks	18824	19448	19292	19864	20592	21736	22152	22880	24856	24648
338	Payroll and timekeeping clerks	20280	20696	21372	21320	22932	23556	24648	23868	26208	28756
339	Billing clerks	18252	18200	18876	19396	20748	20852	21268	22256	22256	24648
343	Cost and rate clerks	21632	19500	19396	19864	20800	21684	22152	22620	24596	24908
344	Billing, posting, and calculating machine operators	18460	19500	17732	18356	20332	20904	21268	20800	23764	24856
	Duplicating, mail, and other office machine operators	18928	19500	19448	19968	20332	20956	21736	22204	23348	24388
345	Duplicating machine operators	18928	19500	19448	19968	20332	20956	21736	22204	23348	24388
346	Mail preparing and paper handling machine operators	18928	19500	19448	19968	20332	20956	21736	22204	23348	24388
347	Office machine operators, n.e.c.	18928	19500	19448	19968	20332	20956	21736	22204	23348	24388
	Communications equipment operators	19864	19396	19344	19760	19084	18564	19136	19084	19812	20644
348	Telephone operators	19604	19552	19760	19760	18668	18512	19344	18980	19968	20800
353	Communications equipment operators, n.e.c.	19864	19396	19344	19760	19084	18564	19136	19084	19812	20644
	Mail and message distributing occupations	26468	27872	26884	25532	27092	27196	28184	29900	29276	30836
354	Postal clerks, except mail carriers	30264	30836	30576	32084	31824	32396	32084	34840	34476	34008
355	Mail carriers, postal service	30524	31304	32500	31304	33592	31720	31876	33592	33904	33332
356	Mail clerks, except postal service	14976	15652	17004	16172	16328	17524	17264	19864	19084	22672
357	Messengers	26468	27872	26884	25532	19084	18564	19136	19084	19812	30836
	Material recording, scheduling, and distributing clerks	18200	18772	19188	19656	19708	20436	21528	21684	23400	23764
359	Dispatchers	20176	20592	18824	19552	21840	21736	20956	22932	23400	25116
363	Production coordinators	22776	23712	22932	24752	24024	25740	26936	24648	27144	30160
364	Traffic, shipping, and receiving clerks	16692	16640	17576	17576	17628	18720	20020	20176	21632	21476
365	Stock and inventory clerks	17680	18304	19500	20904	19032	19656	21112	22776	24128	22412

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
366	Meter readers	18200	18772	19188	19656	19084	18564	19136	19084	19812	23764
368	Weighers, measurers, checkers, and samplers	18200	18772	19188	19656	19084	18564	19136	19084	19812	23764
373	Expediters	16744	18460	18876	17524	17992	18824	19396	18928	21476	21632
374	Material recording, scheduling, and distributing clerks, n.e.c..	18200	18772	19188	19656	19084	18564	19136	19084	19812	23764
	Adjusters and investigators	19916	20332	20956	21372	21632	22152	23140	23556	24804	25844
375	Insurance adjusters, examiners, and investigators	21268	21528	22100	22256	23816	24596	25324	26052	26156	28392
376	Investigators and adjusters, except insurance	19240	19864	20488	20852	20800	21372	22412	22620	23868	25324
377	Eligibility clerks, social welfare	19760	20800	23348	22776	22932	23972	23348	24336	25220	25220
378	Bill and account collectors	19240	19344	19032	20592	21112	21008	21372	22308	24596	24336
	Miscellaneous administrative support occupations	17992	18044	18356	18252	18616	19448	20228	20748	21840	22724
379	General office clerks	18148	18096	19084	18720	18772	19656	20384	21476	22360	24024
383	Bank tellers	14820	15080	15340	15496	16276	16692	17108	17836	18408	19344
384	Proofreaders	17992	18044	18356	18252	19084	18564	19136	19084	19812	22724
385	Data-entry keyers	17888	17784	18460	18356	18720	19968	21268	21840	22672	22932
386	Statistical clerks	17992	18044	20592	19188	20384	21424	20072	20852	22204	21788
387	Teachers' aides	13676	13884	13156	13884	14144	15080	15808	16328	17576	18512
389	Administrative support occupations, n.e.c.	20904	21268	21112	22568	19084	18564	19136	19084	19812	22724
G	Service occupations	12896	13468	13364	13728	14196	14664	15392	15808	16432	17420
	Private household occupations	9204	9516	9204	10036	11076	11076	11440	12480	13572	13260
403	Launderers and ironers	9204	9516	9204	10036	11076	11076	11440	12480	13572	13260
404	Cooks, private household	9204	9516	9204	10036	11076	11076	11440	12480	13572	13260
405	Housekeepers and butlers	9204	9516	9204	10036	11076	11076	11440	12480	13572	13260
406	Child care workers, private households	7956	7852	8164	9464	10296	10608	10816	11024	13728	12740
407	Private household cleaners and servants	9828	10348	10036	10348	11492	11284	11804	13260	13468	13208
	Protective service occupations	20748	21684	22360	22776	22828	23452	25012	25584	26000	26468
	Supervisors, protective service occupations	20748	21684	22360	22776	22828	23452	25012	25584	26000	26468
413	Supervisors, firefighting and fire prevention	20748	21684	22360	22776	22828	23452	25012	25584	26000	26468
414	Supervisors, police and detectives	20748	21684	22360	22776	22828	23452	25012	25584	26000	26468
415	Supervisors, guards	20748	21684	22360	22776	22828	23452	25012	25584	26000	26468
	Firefighting and fire prevention occupations	20748	21684	22360	22776	22828	23452	25012	25584	26000	26468
416	Fire inspection and fire prevention occupations	20748	21684	22360	22776	22828	23452	25012	25584	26000	26468
417	Firefighting occupations	20748	21684	22360	22776	22828	23452	25012	25584	26000	26468
	Police and detectives	23140	25584	25116	26572	27040	28444	30316	29848	29068	30888
418	Police and detectives, public service	23140	29952	30264	29692	32084	34008	32916	33800	36036	37700

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female 1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
423	Sheriffs, bailiffs, and other law enforcement officers	23140	25584	25116	26572	22828	23452	25012	25584	26000	30888
424	Correctional institution officers	21424	22724	20748	23244	23348	25116	26468	25584	25740	26104
	Guards	14872	16952	17316	15912	15340	16120	17160	17420	20020	20332
425	Crossing guards	14872	16952	17316	15912	22828	23452	25012	25584	20020	20332
426	Guards and police, except public service	15912	18876	18460	16484	15704	16588	18044	19136	21528	21476
427	Protective service occupations, n.e.c.	14872	16952	17316	15912	22828	23452	25012	25584	26000	26468
	Service occupations, except protective and private household	12896	13468	13312	13728	14144	14560	15340	15704	16328	17264
	Food preparation and service occupations	11492	11960	12428	12792	13156	13416	14092	14872	15288	16068
433	Supervisors, food preparation and service occupations	14768	13988	15288	14872	15288	14248	15808	16120	16692	18200
434	Bartenders	12064	13780	14716	13624	14404	15236	15236	17368	17472	17576
435	Waiters and waitresses	11128	11440	12220	13416	13156	13936	14664	15288	15652	16484
436	Cooks	11388	12116	12220	12376	12584	12740	13468	14508	15080	15860
438	Food counter, fountain, and related occupations	11492	11960	12428	10140	14144	10868	12532	12844	12740	13572
439	Kitchen workers, food preparation	11856	12168	11388	11700	13780	13884	14300	15340	15028	16016
443	Waiters'/ Waitresses' assistants	10816	11960	12272	11440	14456	13624	13780	14664	15236	16120
444	Miscellaneous food preparation occupations	11700	12116	11700	13676	12428	13104	13988	14040	14976	15392
	Health service occupations	14352	14924	14352	14664	15236	15704	16380	16640	17628	18876
445	Dental assistants	17316	16848	17056	17576	18668	18980	19188	19396	21684	22516
446	Health aides, except nursing	15756	15808	14716	14820	15912	15600	17420	16484	18200	18928
447	Nursing aides, orderlies, and attendants	13780	14508	14092	14300	14872	15392	16016	16536	17316	18512
	Cleaning and building service occupations, except household	12740	13000	12948	13260	13832	14196	14976	15184	15964	16380
448	Supervisors, cleaning and building service workers	15912	15912	15964	15756	14144	17108	18096	16484	19968	16380
449	Maids and housemen	11648	12428	12272	12376	13156	13468	14144	15028	15444	16016
453	Janitors and cleaners	13416	13260	13260	13468	14144	14300	15184	15236	16068	16536
454	Elevator operators	12740	13000	12948	13260	14144	14560	15340	15704	16328	16380
455	Pest control occupations	12740	13000	12948	13260	14144	14560	15340	15704	16328	16380
	Personal service occupations	13000	14092	13416	13988	14352	14872	15652	16120	16692	18460
456	Supervisors, personal service occupations	13000	14092	13416	13988	14144	14560	15340	15704	16328	18460
457	Barbers	13000	14092	13416	13988	14144	14560	15340	15704	16328	18460
458	Hairdressers and cosmetologists	13208	14092	14300	14612	14976	15912	16276	16796	17628	19448
459	Attendants, amusement and recreation facilities	13000	14092	13416	13988	14144	14560	15340	19968	18980	17836
461	Guides	13000	14092	13416	13988	14144	14560	15340	15704	16328	18460
462	Ushers	13000	14092	13416	13988	14144	14560	15340	15704	16328	18460
463	Public transportation attendants	13000	14092	24128	13988	14144	14560	29900	15704	31356	29172

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
464	Baggage porters and bellhops	13000	14092	13416	13988	14144	14560	15340	15704	16328	18460
465	Welfare service aides	13000	14092	13416	13988	14144	15548	15340	15704	18616	20540
466	Family child care providers	13000	14092	13416	13988	14144	14560	15340	15704	16328	18460
467	Early childhood teacher's assistants	11336	12428	11180	11856	11960	12324	13728	14248	14716	15912
468	Child care workers, n.e.c.	13312	14040	11544	14560	14144	14560	15340	15704	16328	18460
469	Personal service occupations, n.e.c.	13000	16328	15236	14404	14144	14560	15340	15704	16328	18460
I	Precision production, craft, and repair occupations	17472	17888	19240	19292	19396	19864	21216	22256	23140	24908
	Mechanics and repairers	27196	28236	27040	28600	26520	25428	26988	30784	32604	30888
503	Supervisors, mechanics and repairers	27196	28236	27040	28600	19396	19864	21216	22256	23140	30888
	Mechanics and repairers, except supervisors	27092	27352	26572	27872	26104	24700	26832	28860	32292	30472
	Vehicle and mobile equipment	27196	28236	27040	28600	19396	19864	21216	22256	23140	30888
	Mechanics and repairers	27196	28236	27040	28600	19396	19864	21216	22256	23140	30888
505	Automobile mechanics	27196	28236	27040	28600	19396	19864	21216	22256	23140	30888
506	Automobile mechanic apprentices	27196	28236	27040	28600	19396	19864	21216	22256	23140	30888
507	Bus, truck, and stationary engine mechanics	27196	28236	27040	28600	19396	19864	21216	22256	23140	30888
508	Aircraft engine mechanics	27196	28236	27040	28600	19396	19864	21216	22256	23140	30888
509	Small engine repairers	27196	28236	27040	28600	19396	19864	21216	22256	23140	30888
514	Automobile body and related repairers	27196	28236	27040	28600	19396	19864	21216	22256	23140	30888
515	Aircraft mechanics, except engine	27196	28236	27040	28600	19396	19864	21216	22256	23140	30888
516	Heavy equipment mechanics	27196	28236	27040	28600	19396	19864	21216	22256	23140	30888
517	Farm equipment mechanics	27196	28236	27040	28600	19396	19864	21216	22256	23140	30888
518	Industrial machinery repairers	27196	28236	27040	28600	19396	19864	21216	22256	23140	30888
519	Machinery maintenance occupations	27092	27352	26572	27872	19396	19864	21216	22256	23140	30888
	Electrical and electronic equipment repairers	27092	32084	30368	32032	28184	28860	28600	32032	33696	33852
523	Electronic repairers, communications and industrial equipment	27092	32084	30368	32032	19396	19864	21216	22256	23140	33852
525	Data processing equipment repairers	27092	32084	30368	32032	19396	19864	21216	22256	33176	33852
526	Household appliance and power tool repairers	27092	32084	30368	32032	19396	19864	21216	22256	23140	33852
527	Telephone line installers and repairers	27092	32084	30368	32032	19396	19864	21216	22256	23140	33852
529	Telephone installers and repairers	27092	32084	30368	32032	19396	19864	21216	22256	23140	33852
533	Miscellaneous electrical and electronic equipment repairers	27092	32084	30368	32032	19396	19864	21216	22256	23140	33852
534	Heating, air conditioning, and refrigeration mechanics	27092	32084	30368	32032	19396	19864	21216	22256	23140	33852
	Miscellaneous mechanics and repairers	27092	32084	30368	32032	19396	19864	21216	22256	23140	30888
535	Camera, watch, and musical instrument repairers	27092	32084	30368	32032	19396	19864	21216	22256	23140	30888
536	Locksmiths and safe repairers	27092	32084	30368	32032	19396	19864	21216	22256	23140	30888

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
538	Office machine repairers	27092	32084	30368	32032	19396	19864	21216	22256	23140	30888
539	Mechanical controls and valve repairers	27092	32084	30368	32032	19396	19864	21216	22256	23140	30888
543	Elevator installers and repairers	27092	32084	30368	32032	19396	19864	21216	22256	23140	30888
544	Millwrights	27092	32084	30368	32032	19396	19864	21216	22256	23140	30888
547	Specified mechanics and repairers, n.e.c.	27092	32084	30368	32032	19396	19864	21216	22256	23140	30888
549	Not specified mechanics and repairers	27092	32084	30368	32032	19396	19864	21216	22256	23140	30888
	Construction trades	17472	17888	21216	20800	20228	23140	21216	21996	24700	22724
	Supervisors, construction occupations	17472	17888	21216	20800	20228	23140	21216	21996	24700	22724
553	Supervisors, brickmasons, stonemasons, and tile setters	17472	17888	21216	20800	20228	23140	21216	21996	24700	22724
554	Supervisors, carpenters and related workers	17472	17888	21216	20800	20228	23140	21216	21996	24700	22724
555	Supervisors, electricians and power transmission installers	17472	17888	21216	20800	20228	23140	21216	21996	24700	22724
556	Supervisors, painters, paperhangers, and plasterers	17472	17888	21216	20800	20228	23140	21216	21996	24700	22724
557	Supervisors, plumbers, pipefitters, and steamfitters	17472	17888	21216	20800	20228	23140	21216	21996	24700	22724
558	Supervisors, n.e.c.	17472	17888	21216	20800	20228	23140	21216	21996	24700	22724
	Construction trades, except supervisors	17472	17888	21216	19916	20176	22984	20956	21684	23452	22048
563	Brickmasons and stonemasons	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
564	Brickmason and stonemason apprentices	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
565	Tile setters, hard and soft	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
566	Carpet installers	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
567	Carpenters	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
569	Carpenters apprentices	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
573	Drywall installers	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
575	Electricians	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
576	Electrician apprentices	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
577	Electrical power installers and repairers	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
579	Painters, construction and maintenance	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
583	Paperhangers	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
584	Plasterers	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
585	Plumbers, pipefitters, and steamfitters	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
587	Plumber, pipefitter, and steamfitter apprentices	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
588	Concrete and terrazzo finishers	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
589	Glaziers	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
593	Insulation workers	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
594	Paving, surfacing, and tamping equipment operators	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
595	Roofers	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
596	Sheet metal duct installers	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
597	Structural metalworkers	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
598	Drillers, earth	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
599	Construction trades, n.e.c.	17472	17888	21216	20800	20176	22984	20956	21684	23452	22048
	Extractive occupations	17472	17888	19240	19292	19396	19864	21216	22256	23140	24908
613	Supervisors, extractive occupations	17472	17888	19240	19292	19396	19864	21216	22256	23140	24908
614	Drillers, oil well	17472	17888	19240	19292	19396	19864	21216	22256	23140	24908
615	Explosives workers	17472	17888	19240	19292	19396	19864	21216	22256	23140	24908
616	Mining machine operators	17472	17888	19240	19292	19396	19864	21216	22256	23140	24908
617	Mining occupations, n.e.c.	17472	17888	19240	19292	19396	19864	21216	22256	23140	24908
	Precision production occupations	16432	16588	17784	17888	18512	18824	20384	20956	21528	23452
628	Supervisors, production occupations	20800	20592	21632	22256	23816	22620	24856	26780	27040	29692
	Precision metalworking occupations	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
634	Tool and die makers	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
635	Tool and die maker apprentices	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
636	Precision assemblers, metal	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
637	Machinists	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
639	Machinist apprentices	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
643	Boilermakers	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
644	Precision grinders, filers, and tool sharpeners	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
645	Patternmakers and model makers, metal	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
646	Lay-out workers	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
647	Precious stones and metals workers (jewelers)	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
649	Engravers metal	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
653	Sheet metal workers	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
654	Sheet metal worker apprentices	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
655	Miscellaneous precision metalworkers	16432	17576	17784	17368	19084	20748	23088	22984	21528	26520
	Precision woodworking occupations	16432	16588	17784	17888	19396	19864	21216	22256	21528	23452
656	Patternmakers and model makers, wood	16432	16588	17784	17888	19396	19864	21216	22256	21528	23452
657	Cabinet makers and bench carpenters	16432	16588	17784	17888	19396	19864	21216	22256	21528	23452
658	Furniture and wood finishers	16432	16588	17784	17888	19396	19864	21216	22256	21528	23452
659	Miscellaneous precision woodworkers	16432	16588	17784	17888	19396	19864	21216	22256	21528	23452

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-

2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Precision textile, apparel, and furnishings machine workers	12740	14144	17784	15132	16016	19864	21216	18200	21528	20280
666	Dressmakers	12740	14144	17784	15132	16016	19864	21216	18200	21528	20280
667	Tailors	12740	14144	17784	15132	16016	19864	21216	18200	21528	20280
668	Upholsterers	12740	14144	17784	15132	16016	19864	21216	18200	21528	20280
669	Shoe repairers	12740	14144	17784	15132	16016	19864	21216	18200	21528	20280
674	Miscellaneous precision apparel and fabric workers	12740	14144	17784	15132	16016	19864	21216	18200	21528	20280
	Precision workers, assorted materials	15808	16328	16744	16796	17524	16848	18772	19188	20644	21736
675	Hand molders and shapers, except jewelers	15808	16328	16744	16796	17524	16848	18772	19188	20644	21736
676	Patternmakers, lay-out workers, and cutters	15808	16328	16744	16796	17524	16848	18772	19188	20644	21736
677	Optical goods workers	15808	16328	16744	16796	17524	16848	18772	19188	20644	21736
678	Dental laboratory and medical appliance technicians	15808	16328	16744	16796	17524	16848	18772	19188	20644	21736
679	Bookbinders	15808	16328	16744	16796	17524	16848	18772	19188	20644	21736
683	Electrical and electronic equipment assemblers	15548	16380	16900	16588	17368	16432	18564	18668	20280	21372
684	Miscellaneous precision workers, n.e.c.	15808	16328	16744	16796	17524	16848	18772	19188	20644	21736
	Precision food production occupations	12948	13884	13624	15236	16120	15704	17888	17784	19032	19500
686	Butchers and meat cutters	12584	13520	13416	15236	16120	15704	17888	16744	18460	19500
687	Bakers	12948	13884	13624	15236	16120	15704	17888	17784	19032	18876
688	Food batchmakers	12948	13884	13624	15236	16120	15704	17888	17784	19032	19500
	Precision inspectors, testers, and related workers	12948	13884	13624	15236	16120	15704	17888	17784	21528	19500
689	Inspectors, testers, and graders	12948	13884	13624	15236	16120	15704	17888	17784	21528	19500
693	Adjusters and calibrators	12948	13884	13624	15236	16120	15704	17888	17784	21528	19500
	Plant and system operators	16432	16588	17784	17888	16120	15704	17888	17784	21528	19500
694	Water and sewage treatment plant operators	16432	16588	17784	17888	16120	15704	17888	17784	21528	19500
695	Power plant operators	16432	16588	17784	17888	16120	15704	17888	17784	21528	19500
696	Stationary engineers	16432	16588	17784	17888	16120	15704	17888	17784	21528	19500
699	Miscellaneous plant and system operators	16432	16588	17784	17888	16120	15704	17888	17784	21528	19500
	Operators, fabricators, and laborers	14508	14976	15236	15444	15964	16276	17004	17524	18252	19136
J	Machine operators, assemblers and inspectors	14300	14768	15184	15392	15964	16276	17056	17680	18460	19188
	Machine operators and tenders, except precision	13468	13884	14820	14976	15600	15912	16640	16952	17784	18720
	Metalworking and plastic working machine operators	16432	17628	16796	14976	17992	19240	20124	21320	23400	23816
703	Lathe and turning machine set-up operators	16432	17628	16796	14976	15964	16276	17056	17680	18460	23816
704	Lathe and turning machine operators	16432	17628	16796	14976	15964	16276	17056	17680	18460	23816
705	Milling and planing machine operators	16432	17628	16796	14976	15964	16276	17056	17680	18460	23816
706	Punching and stamping press machine operators	16432	17628	16796	14976	15964	16276	17056	17680	18460	23816

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
707	Rolling machine operators	16432	17628	16796	14976	15964	16276	17056	17680	18460	23816
708	Drilling and boring machine operators	16432	17628	16796	14976	15964	16276	17056	17680	18460	23816
709	Grinding, abrading, buffing, and polishing machine operators	16432	17628	16796	14976	15964	16276	17056	17680	18460	23816
713	Forging machine operators	16432	17628	16796	14976	15964	16276	17056	17680	18460	23816
714	Numerical control machine operators	16432	17628	16796	14976	15964	16276	17056	17680	18460	23816
715	Miscellaneous metal, plastic, stone, and glass working machine operators	16432	17628	16796	14976	15964	16276	17056	17680	18460	23816
717	Fabricating machine operators, n.e.c.	16432	17628	16796	14976	15964	16276	17056	17680	18460	23816
	Metal and plastic processing machine operators	13468	13884	14820	14976	15964	16276	17056	17680	18460	19188
719	Molding and casting machine operators	13468	13884	14820	14976	15964	16276	17056	17680	18460	19188
723	Metal plating machine operators	13468	13884	14820	14976	15964	16276	17056	17680	18460	19188
724	Heat treating equipment operators	13468	13884	14820	14976	15964	16276	17056	17680	18460	19188
725	Miscellaneous metal and plastic processing machine operators	13468	13884	14820	14976	15964	16276	17056	17680	18460	19188
	Woodworking machine operators	13468	13884	14820	14976	15964	16276	17056	17680	18460	19188
726	Wood lathe, routing, and planing machine operators	13468	13884	14820	14976	15964	16276	17056	17680	18460	19188
727	Sawing machine operators	13468	13884	14820	14976	15964	16276	17056	17680	18460	19188
728	Shaping and joining machine operators	13468	13884	14820	14976	15964	16276	17056	17680	18460	19188
729	Nailing and tacking machine operators	13468	13884	14820	14976	15964	16276	17056	17680	18460	19188
733	Miscellaneous woodworking machine operators	13468	13884	14820	14976	15964	16276	17056	17680	18460	19188
	Printing machine operators	16016	16276	18304	18720	20540	18356	19968	19032	17940	21736
734	Printing press operators	16016	16276	18304	18720	15964	16276	17056	17680	18460	21736
735	Photoengravers and lithographers	16016	16276	18304	18720	15964	16276	17056	17680	18460	21736
736	Typesetters and compositors	16016	16276	18304	18720	15964	16276	17056	17680	18460	21736
737	Miscellaneous printing machine operators	16016	16276	18304	18720	15964	16276	17056	17680	18460	21736
	Textile, apparel, and furnishings machine operators	11596	12168	12792	13156	15964	13780	14820	14664	15808	16588
738	Winding and twisting machine operators	11596	12168	12792	13156	13364	16276	17056	17680	18460	16588
739	Knitting, looping, taping, and weaving machine operators	11596	12168	12792	13156	15964	16276	17056	17680	18460	16588
743	Textile cutting machine operators	11596	12168	12792	13156	15964	16276	17056	17680	18460	16588
744	Textile sewing machine operators	11232	11544	12064	12792	15964	13520	14456	14196	15652	16172
745	Shoe machine operators	11596	12168	12792	13156	15964	16276	17056	17680	18460	16588
747	Pressing machine operators	11440	11388	13312	11700	12948	12532	17056	13520	18460	16588
748	Laundering and dry cleaning machine operators	11388	12376	12844	12740	11960	13156	14040	13832	14508	15912
749	Miscellaneous textile machine operators	11596	12168	12792	13156	15964	16276	17056	17680	18460	16588

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female 1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Machine operators, assorted materials	15132	15340	16068	16068	12636	17264	18044	18200	18876	19344
753	Cementing and gluing machine operators	15132	15340	16068	16068	15964	16276	17056	17680	18460	19344
754	Packaging and filling machine operators	14560	14404	14560	14976	17004	15912	16432	17004	17004	17992
755	Extruding and forming machine operators	15132	15340	16068	16068	15964	16276	17056	17680	18460	19344
756	Mixing and blending machine operators	11596	12168	12792	13156	15704	16276	17056	17680	18460	19344
757	Separating, filtering, and clarifying machine operators	11596	12168	12792	13156	15964	16276	17056	17680	18460	19344
758	Compressing and compacting machine operators	15132	15340	16068	16068	15964	16276	17056	17680	18460	19344
759	Painting and paint spraying machine operators	11596	12168	12792	13156	15964	16276	17056	17680	18460	19344
763	Roasting and baking machine operators, food	15132	15340	16068	16068	15964	16276	17056	17680	18460	19344
764	Washing, cleaning, and pickling machine operators	15132	15340	16068	16068	15964	16276	17056	17680	18460	19344
765	Folding machine operators	15132	15340	16068	16068	15964	16276	17056	17680	18460	19344
766	Furnace, kiln, and oven operators, except food	11596	12168	12792	13156	15964	16276	17056	17680	18460	19344
768	Crushing and grinding machine operators	15132	15340	16068	16068	15964	16276	17056	17680	18460	19344
769	Slicing and cutting machine operators	13104	12168	12792	14404	15964	16276	17056	17680	18460	19344
773	Motion picture projectionists	15132	15340	16068	16068	15964	16276	17056	17680	18460	19344
774	Photographic process machine operators	15132	15340	16068	16068	15964	16276	17056	17680	18460	19344
777	Miscellaneous machine operators, n.e.c.	16068	16120	17576	16796	15964	16276	17056	17680	18460	18720
779	Machine operators, not specified	15028	15808	16744	17004	15964	16276	17056	17680	18460	18720
	Fabricators, assemblers, and hand working occupations	15652	15912	15600	16068	16640	16640	18044	18980	19760	19552
783	Welders and cutters	15652	15912	15600	16068	16640	16640	18044	18980	19760	19552
784	Solderers and brazers	15652	15912	15600	16068	16640	16640	18044	18980	19760	19552
785	Assemblers	15756	15964	15652	15912	16744	16588	18044	19136	19864	19812
786	Hand cutting and trimming occupations	15652	15912	15600	16068	16640	16640	18044	18980	19760	19552
787	Hand molding, casting, and forming occupations	15652	15912	15600	16068	16640	16640	18044	18980	19760	19552
789	Hand painting, coating, and decorating occupations	15652	15912	15600	16068	16640	16640	18044	18980	19760	19552
793	Hand engraving and printing occupations	15652	15912	15600	16068	16640	16640	18044	18980	19760	19552
795	Miscellaneous hand working occupations	15652	15912	15600	16068	16640	16640	18044	18980	19760	19552
	Production inspectors, testers, samplers, and weighers	15704	16276	16328	16224	16796	17420	17472	19188	19136	20800
796	Production inspectors, checkers, and examiners	16068	16796	16848	16640	17992	18564	18616	20540	19708	21320
797	Production testers	15704	16276	16328	16224	16796	17420	17472	19188	19136	20800
798	Production samplers and weighers	15704	16276	16328	16224	16796	17420	17472	19188	19136	20800
799	Graders and sorters, except agricultural	11648	14456	13520	14144	13416	13936	15028	14976	15860	16276

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
K	Transportation and material moving occupations	17108	18616	18772	18408	18200	19396	19396	20488	21164	22828
	Motor vehicle operators	16536	18616	17368	17420	17940	19240	18824	20228	20748	21944
803	Supervisors motor vehicle operators	16536	18616	17368	17420	17940	19240	18824	20228	20748	21944
804	Truck drivers	15548	17212	17160	17940	17940	19240	19292	21424	21164	23712
806	Driver-sales workers	16536	18616	17368	17420	18668	20748	18824	20228	20748	21944
808	Bus drivers	17108	19136	17472	17212	17940	18512	18304	19968	20852	21580
809	Taxicab drivers and chauffeurs	16536	18616	17368	17420	17108	19240	18824	20228	20748	21944
813	Parking lot attendants	16536	18616	17368	17420	17940	19240	18824	20228	20748	21944
814	Motor transportation occupations, n.e.c.	16536	18616	17368	17420	17940	19240	18824	20228	20748	21944
	Transportation occupations, except motor vehicle	17108	18616	18772	18408	18200	19396	19396	20488	21164	22828
	Rail transportation occupations	17108	18616	18772	18408	18200	19396	19396	20488	21164	22828
823	Railroad conductors and yardmasters	17108	18616	18772	18408	18200	19396	19396	20488	21164	22828
824	Locomotive operating occupations	17108	18616	18772	18408	18200	19396	19396	20488	21164	22828
825	Railroad brake, signal, and switch operators	17108	18616	18772	18408	18200	19396	19396	20488	21164	22828
826	Rail vehicle operators, n.e.c.	17108	18616	18772	18408	18200	19396	19396	20488	21164	22828
	Water transportation occupations	17108	18616	18772	18408	18200	19396	19396	20488	21164	22828
828	Ship captains and mates, except fishing boats	17108	18616	18772	18408	18200	19396	19396	20488	21164	22828
829	Sailors and deckhands	17108	18616	18772	18408	18200	19396	19396	20488	21164	22828
833	Marine engineers	17108	18616	18772	18408	18200	19396	19396	20488	21164	22828
834	Bridge, lock, and lighthouse tenders	17108	18616	18772	18408	18200	19396	19396	20488	21164	22828
	Material moving equipment operators	17108	18616	18772	23608	19448	19396	20644	21580	22048	25272
843	Supervisors, material moving equipment operators	17108	18616	18772	23608	19448	19396	20644	21580	22048	25272
844	Operating engineers	17108	18616	18772	23608	19448	19396	20644	21580	22048	25272
845	Longshore equipment operators	17108	18616	18772	23608	19448	19396	20644	21580	22048	25272
848	Hoist and winch operators	17108	18616	18772	23608	19448	19396	20644	21580	22048	25272
849	Crane and tower operators	17108	18616	18772	23608	19448	19396	20644	21580	22048	25272
853	Excavating and loading machine operators	17108	18616	18772	23608	19448	19396	20644	21580	22048	25272
855	Grader, dozer, and scraper operators	17108	18616	18772	23608	19448	19396	20644	21580	22048	25272
856	Industrial truck and tractor equipment operators	17108	18616	18772	23608	19448	19396	20644	21580	22048	25272
859	Miscellaneous material moving equipment operators	17108	18616	18772	23608	19448	19396	20644	21580	22048	25272

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

	Occupation	Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
L	Handlers, equipment cleaners, helpers, and laborers	14508	14872	14508	14768	15340	15548	16172	16328	16640	17784
864	Supervisors, handlers, equipment cleaners, and laborers, n.e.c.	14508	14872	14508	14768	15340	15548	16172	16328	16640	17784
865	Helpers, mechanics and repairers	14508	14872	14508	14768	15340	15548	16172	16328	16640	17784
**	Helpers, construction and extractive occupations	14508	14872	14508	14768	15340	15548	16172	16328	16640	17784
866	Helpers, construction trades	14508	14872	14508	14768	15340	15548	16172	16328	16640	17784
867	Helpers, surveyor	14508	14872	14508	14768	15340	15548	16172	16328	16640	17784
868	Helpers, extractive occupations	14508	14872	14508	14768	15340	15548	16172	16328	16640	17784
869	Construction laborers	14508	14872	14508	14768	15340	15548	16172	16328	16640	17784
874	Production helpers	14508	14872	14508	14768	15340	15548	16172	16328	16640	17784
	Freight, stock, and material handlers	14456	14456	13780	14612	14976	15028	16224	16536	16432	17732
875	Garbage collectors	14456	14456	13780	14612	14976	15028	16224	16536	16432	17732
876	Stevedores	14456	14456	13780	14612	14976	15028	16224	16536	16432	17732
877	Stock handlers and baggers	13416	13312	12584	12896	14976	13780	15132	15600	15808	16484
878	Machine feeders and offbearers	14456	14456	13780	14612	13624	15028	16224	16536	16432	17732
883	Freight, stock, and material handlers, n.e.c.	14456	16692	16484	18408	14976	15028	16224	16536	16432	17732
885	Garage and service station related occupations	14508	14872	14508	14768	15340	15548	16172	16328	16432	17784
887	Vehicle washers and equipment cleaners	14508	14872	14508	14768	15340	15548	16172	16328	16432	17784
888	Hand packers and packagers	13676	14404	14456	14716	15704	15392	15652	15860	16068	16692
889	Laborers, except construction	15184	15392	15132	14820	15496	15964	17212	16380	17628	18980
H	Farming, forestry, and fishing occupations	11596	12584	12168	12948	13260	13364	14144	14716	15288	16016
	Farm operators and managers	11596	12584	12168	12948	13260	13364	14144	14716	15288	16016
473	Farmers, except horticultural	11596	12584	12168	12948	13260	13364	14144	14716	15288	16016
474	Horticulture specialty farmers	11596	12584	12168	12948	13260	13364	14144	14716	15288	16016
	Farm managers	11596	12584	12168	12948	13260	13364	14144	14716	15288	16016
475	Managers, farm, except horticultural	11596	12584	12168	12948	13260	13364	14144	14716	15288	16016
476	Managers, horticultural specialty farms	11596	12584	12168	12948	13260	13364	14144	14716	15288	16016
	Other agricultural and related occupations	11492	12480	12168	12792	12948	13208	14040	14404	15132	15756
	Farm occupations, except managerial	10764	12116	12116	11752	11908	12792	13728	13936	14820	14716
477	Supervisors, farm workers	10764	12116	12116	11752	12948	13208	14040	14404	15132	15756
479	Farm workers	10660	12064	11908	11284	11492	12844	13624	13468	14612	14768
483	Marine life cultivation workers	10764	12116	12116	11752	12948	13208	14040	14404	15132	15756
484	Nursery workers	10764	12116	12116	11752	12948	13208	14040	14404	15132	15756

Appendix B. Median Annual Earnings of Wage and Salary Workers Who Usually Work Full Time, by Detailed Occupation and Sex, 1992-2001, Continued

Occupation		Female									
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Related agricultural occupations	12844	12844	12272	14300	14092	13520	14248	14976	15340	16380
485	Supervisors, related agricultural occupations	12844	12844	12272	14300	12948	13208	14040	14404	15132	16380
486	Groundskeepers and gardeners, except farm	12844	12844	12272	14300	12948	13208	14040	14404	15132	16380
487	Animal caretakers, except farm	12844	12844	12272	14300	12948	13208	14040	14404	15132	16796
488	Graders and sorters, agricultural products	12844	12844	12272	14300	12948	13208	14040	14404	15132	16380
489	Inspectors, agricultural products	12844	12844	12272	14300	12948	13208	14040	14404	15132	16380
	Forestry and logging occupations	11596	12584	12168	12948	12948	13208	14040	14404	15132	16380
494	Supervisors, forestry and logging occupations	11596	12584	12168	12948	12948	13208	14040	14404	15132	16380
495	Forestry workers, except logging	11596	12584	12168	12948	12948	13208	14040	14404	15132	16380
496	Timber cutting and logging occupations	11596	12584	12168	12948	12948	13208	14040	14404	15132	16380
	Fishers, hunters, and trappers	11596	12584	12168	12948	12948	13208	14040	14404	15132	16380
497	Captains and other officers, fishing vessels	11596	12584	12168	12948	12948	13208	14040	14404	15132	16380
498	Fishers	11596	12584	12168	12948	12948	13208	14040	14404	15132	16380
499	Hunters and trappers	11596	12584	12168	12948	12948	13208	14040	14404	15132	16380
999	Occupation not reported	19812	20540	20748	21112	12948	13208	14040	14404	15132	26572

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics, Current population Survey, 1992-2002 annual averages.
NOTE: Medians were not available where the base was under 50,000. Medians for such cases used the next highest aggregated level as a proxy. Detail data may not sum to totals because of rounding.
N.e.c. = not elsewhere classified.

Appendix C. Age Adjustment by Sex, 1992-2001

Age	Male									
	1992	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
16	0.379	0.374	0.380	0.387	0.379	0.383	0.384	0.396	0.405	0.428
17	0.414	0.409	0.413	0.420	0.412	0.416	0.418	0.431	0.439	0.462
18	0.449	0.444	0.447	0.453	0.445	0.450	0.452	0.465	0.473	0.496
19	0.484	0.478	0.480	0.486	0.478	0.483	0.485	0.499	0.506	0.529
20	0.519	0.513	0.513	0.519	0.511	0.516	0.519	0.533	0.540	0.563
21	0.553	0.565	0.547	0.552	0.544	0.550	0.553	0.567	0.573	0.597
22	0.588	0.600	0.580	0.585	0.577	0.583	0.586	0.601	0.607	0.631
23	0.623	0.634	0.613	0.618	0.610	0.616	0.620	0.636	0.641	0.665
24	0.658	0.669	0.647	0.651	0.643	0.649	0.654	0.670	0.674	0.699
25	0.692	0.704	0.680	0.684	0.676	0.683	0.687	0.704	0.708	0.733
26	0.727	0.738	0.714	0.717	0.709	0.716	0.721	0.738	0.741	0.767
27	0.762	0.773	0.747	0.750	0.742	0.749	0.755	0.772	0.775	0.801
28	0.797	0.808	0.780	0.783	0.775	0.783	0.788	0.806	0.809	0.835
29	0.832	0.842	0.814	0.816	0.808	0.816	0.822	0.840	0.842	0.868
30	0.866	0.877	0.847	0.849	0.841	0.849	0.856	0.875	0.876	0.902
31	0.895	0.888	0.876	0.877	0.869	0.877	0.883	0.901	0.902	0.929
32	0.916	0.910	0.901	0.901	0.892	0.900	0.905	0.921	0.921	0.949
33	0.937	0.932	0.926	0.925	0.915	0.923	0.926	0.940	0.940	0.969
34	0.959	0.954	0.951	0.949	0.938	0.946	0.947	0.959	0.959	0.989
35	0.980	0.976	0.976	0.972	0.960	0.969	0.969	0.979	0.978	1.009
36	1.002	0.998	1.000	0.996	0.983	0.992	0.990	0.998	0.997	1.028
37	1.023	1.020	1.025	1.020	1.006	1.014	1.011	1.017	1.016	1.048
38	1.045	1.042	1.050	1.043	1.029	1.037	1.033	1.037	1.035	1.068
39	1.066	1.064	1.075	1.067	1.052	1.060	1.054	1.056	1.054	1.088
40	1.087	1.086	1.100	1.091	1.075	1.083	1.075	1.075	1.073	1.108
41	1.103	1.102	1.117	1.108	1.092	1.100	1.090	1.090	1.085	1.121
42	1.113	1.113	1.127	1.119	1.103	1.110	1.099	1.099	1.092	1.127
43	1.123	1.124	1.137	1.129	1.115	1.120	1.108	1.108	1.099	1.134
44	1.132	1.134	1.146	1.140	1.126	1.131	1.117	1.118	1.106	1.140
45	1.142	1.145	1.156	1.151	1.137	1.141	1.126	1.127	1.113	1.147
46	1.152	1.156	1.166	1.162	1.149	1.152	1.134	1.137	1.120	1.153
47	1.162	1.166	1.176	1.172	1.160	1.162	1.143	1.146	1.126	1.160
48	1.171	1.177	1.185	1.183	1.171	1.173	1.152	1.155	1.133	1.166
49	1.181	1.188	1.195	1.194	1.183	1.183	1.161	1.165	1.140	1.173
50	1.191	1.198	1.205	1.205	1.194	1.193	1.170	1.174	1.147	1.179
51	1.190	1.197	1.204	1.205	1.195	1.195	1.172	1.176	1.147	1.180
52	1.180	1.184	1.191	1.194	1.185	1.188	1.166	1.170	1.142	1.175
53	1.169	1.171	1.179	1.183	1.176	1.180	1.161	1.164	1.136	1.171
54	1.158	1.159	1.167	1.172	1.167	1.173	1.156	1.159	1.130	1.166
55	1.147	1.146	1.155	1.161	1.157	1.165	1.150	1.153	1.124	1.161
56	1.136	1.133	1.142	1.150	1.148	1.158	1.145	1.147	1.118	1.156
57	1.125	1.120	1.130	1.139	1.138	1.151	1.140	1.141	1.113	1.151
58	1.114	1.107	1.118	1.128	1.129	1.143	1.134	1.135	1.107	1.146
59	1.103	1.094	1.106	1.117	1.119	1.136	1.129	1.129	1.101	1.141
60	1.092	1.082	1.093	1.106	1.110	1.128	1.124	1.123	1.095	1.136
61	1.072	1.063	1.073	1.085	1.091	1.106	1.104	1.101	1.078	1.118
62	1.043	1.039	1.043	1.052	1.062	1.070	1.069	1.061	1.048	1.085
63	1.013	1.014	1.014	1.020	1.034	1.033	1.034	1.022	1.018	1.053
64	0.984	0.990	0.985	0.988	1.005	0.997	0.999	0.982	0.988	1.021
65	0.954	0.965	0.956	0.956	0.977	0.961	0.965	0.943	0.959	0.989
66	0.925	0.941	0.927	0.924	0.948	0.924	0.930	0.904	0.929	0.956
67	0.895	0.917	0.897	0.892	0.920	0.888	0.895	0.864	0.899	0.924
68	0.865	0.892	0.868	0.859	0.891	0.851	0.860	0.825	0.869	0.892
69	0.836	0.868	0.839	0.827	0.863	0.815	0.825	0.785	0.840	0.860
70	0.806	0.843	0.810	0.795	0.834	0.778	0.791	0.746	0.810	0.827

Appendix C. Age Adjustment by Sex, 1992-2001, Continued

Age	Female									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
16	0.559	0.546	0.534	0.510	0.531	0.529	0.513	0.537	0.548	0.564
17	0.589	0.576	0.566	0.543	0.562	0.560	0.545	0.568	0.578	0.595
18	0.619	0.607	0.597	0.577	0.593	0.591	0.576	0.598	0.608	0.627
19	0.649	0.637	0.629	0.611	0.624	0.622	0.607	0.628	0.638	0.659
20	0.679	0.668	0.660	0.644	0.655	0.653	0.638	0.659	0.668	0.691
21	0.709	0.698	0.692	0.678	0.686	0.684	0.670	0.689	0.699	0.723
22	0.740	0.728	0.723	0.711	0.716	0.714	0.701	0.720	0.729	0.755
23	0.770	0.759	0.754	0.745	0.747	0.745	0.732	0.750	0.759	0.787
24	0.800	0.789	0.786	0.779	0.778	0.776	0.764	0.780	0.789	0.819
25	0.830	0.820	0.817	0.812	0.809	0.807	0.795	0.811	0.819	0.851
26	0.860	0.850	0.849	0.846	0.840	0.838	0.826	0.841	0.849	0.883
27	0.891	0.880	0.880	0.880	0.871	0.869	0.858	0.871	0.880	0.915
28	0.921	0.911	0.912	0.913	0.902	0.900	0.889	0.902	0.910	0.947
29	0.951	0.941	0.943	0.947	0.933	0.931	0.920	0.932	0.940	0.979
30	0.981	0.972	0.975	0.981	0.964	0.962	0.952	0.963	0.970	1.011
31	1.001	0.992	0.997	1.002	0.985	0.983	0.972	0.981	0.988	1.030
32	1.010	1.002	1.009	1.011	0.996	0.996	0.982	0.988	0.993	1.036
33	1.020	1.012	1.021	1.020	1.007	1.008	0.992	0.995	0.999	1.043
34	1.029	1.022	1.033	1.029	1.019	1.021	1.003	1.002	1.004	1.049
35	1.038	1.033	1.046	1.039	1.030	1.034	1.013	1.009	1.009	1.055
36	1.048	1.043	1.058	1.048	1.041	1.046	1.023	1.015	1.015	1.061
37	1.057	1.053	1.070	1.057	1.053	1.059	1.033	1.022	1.020	1.067
38	1.066	1.063	1.083	1.066	1.064	1.071	1.043	1.029	1.026	1.074
39	1.076	1.074	1.095	1.075	1.075	1.084	1.053	1.036	1.031	1.080
40	1.085	1.084	1.107	1.084	1.087	1.097	1.063	1.043	1.036	1.086
41	1.089	1.089	1.113	1.090	1.095	1.104	1.070	1.050	1.044	1.093
42	1.089	1.090	1.112	1.093	1.099	1.107	1.074	1.056	1.053	1.102
43	1.088	1.091	1.111	1.095	1.103	1.110	1.078	1.062	1.062	1.111
44	1.088	1.092	1.111	1.098	1.107	1.113	1.082	1.069	1.071	1.119
45	1.087	1.093	1.110	1.101	1.112	1.116	1.085	1.075	1.080	1.128
46	1.087	1.094	1.109	1.103	1.116	1.119	1.089	1.082	1.089	1.136
47	1.086	1.095	1.109	1.106	1.120	1.122	1.093	1.088	1.098	1.145
48	1.086	1.096	1.108	1.109	1.124	1.125	1.097	1.095	1.107	1.154
49	1.085	1.097	1.107	1.111	1.129	1.128	1.101	1.101	1.116	1.162
50	1.085	1.098	1.106	1.114	1.133	1.131	1.105	1.108	1.125	1.171
51	1.079	1.093	1.100	1.108	1.128	1.126	1.102	1.106	1.123	1.170
52	1.069	1.082	1.087	1.093	1.113	1.111	1.094	1.098	1.111	1.160
53	1.058	1.071	1.074	1.079	1.099	1.097	1.085	1.089	1.099	1.151
54	1.047	1.060	1.061	1.064	1.085	1.083	1.077	1.080	1.087	1.141
55	1.037	1.048	1.048	1.049	1.070	1.069	1.068	1.072	1.075	1.131
56	1.026	1.037	1.036	1.035	1.056	1.055	1.059	1.063	1.063	1.121
57	1.015	1.026	1.023	1.020	1.041	1.040	1.051	1.054	1.051	1.111
58	1.005	1.015	1.010	1.005	1.027	1.026	1.042	1.045	1.039	1.102
59	0.994	1.004	0.997	0.991	1.013	1.012	1.034	1.037	1.027	1.092
60	0.983	0.992	0.985	0.976	0.998	0.998	1.025	1.028	1.015	1.082
61	0.972	0.979	0.971	0.963	0.981	0.981	1.007	1.011	0.996	1.060
62	0.959	0.964	0.955	0.951	0.961	0.962	0.980	0.985	0.971	1.027
63	0.947	0.949	0.940	0.939	0.940	0.942	0.953	0.960	0.946	0.994
64	0.934	0.934	0.925	0.927	0.920	0.923	0.926	0.935	0.920	0.960
65	0.922	0.918	0.910	0.915	0.900	0.903	0.899	0.909	0.895	0.927
66	0.909	0.903	0.894	0.903	0.879	0.884	0.872	0.884	0.870	0.894
67	0.897	0.888	0.879	0.891	0.859	0.864	0.845	0.858	0.844	0.860
68	0.884	0.873	0.864	0.879	0.839	0.845	0.818	0.833	0.819	0.827
69	0.872	0.858	0.849	0.866	0.818	0.825	0.791	0.808	0.793	0.793
70	0.859	0.842	0.833	0.854	0.798	0.806	0.764	0.782	0.768	0.760

Appendix D. Gross Domestic Product Deflator--Adjustment Factors

Death Year	Initial GDP	Target Year											
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1992	86.4	1	0.978	0.957	0.938	0.921	0.906	0.896	0.883	0.864	0.844	0.831	0.818
1993	88.4	1.023	1	0.979	0.960	0.942	0.926	0.916	0.903	0.884	0.863	0.850	0.836
1994	90.3	1.045	1.021	1	0.980	0.962	0.946	0.936	0.922	0.903	0.882	0.868	0.854
1995	92.1	1.066	1.042	1.020	1	0.981	0.965	0.955	0.941	0.921	0.900	0.886	0.872
1996	93.9	1.086	1.062	1.040	1.019	1	0.984	0.973	0.959	0.939	0.917	0.903	0.888
1997	95.4	1.104	1.079	1.057	1.036	1.017	1	0.989	0.975	0.954	0.932	0.918	0.903
1998	96.5	1.117	1.091	1.069	1.047	1.028	1.011	1	0.986	0.965	0.942	0.928	0.913
1999	97.9	1.133	1.107	1.084	1.062	1.043	1.026	1.014	1	0.979	0.956	0.942	0.926
2000	100.0	1.157	1.131	1.108	1.086	1.065	1.048	1.037	1.022	1	0.977	0.962	0.946
2001	102.4	1.185	1.158	1.134	1.111	1.091	1.073	1.061	1.046	1.024	1	0.985	0.969
2002	103.9	1.203	1.176	1.152	1.128	1.107	1.089	1.077	1.062	1.039	1.015	1	0.984
2003	105.7	1.223	1.196	1.171	1.147	1.126	1.108	1.095	1.080	1.057	1.032	1.017	1

Source: U.S. Department of Commerce/Bureau of Economic Analysis

Appendix E. Employee Benefits as Percent of Payroll, by Standard Industrial Classification System (SIC)

Industry Title	SIC	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total industry	9900-9999	27.2	28.6	28.8	29.6	27.4	28.6	26.6			
All manufacturing		27.9	27.9	29.3	29.7	29.3	28.8	24.4			
Total nonmanufacturing		32.5	24.5	26.3	24.9	25.2	28.0	27.2			
Food, beverages, tobacco	2000-2141	22.3	24.0	21.1	20.7	19.7	20.6	20.5			
Textile and wearing apparel	2200-2399	25.2	25.2	25.0	25.1	23.9	25.9	26.2			
Pulp, paper, lumber and furniture	2400-2679	26.7	24.7	25.6	24.5	27.8	24.8	28.2			
Printing and publishing	2700-2796	28.1	31.7	29.0	26.0	26.8	27.4	28.0			
Chemicals and allied products	2800-2899	25.0	29.7	29.1	25.4	24.4	25.4	17.1			
Petroleum	2900-2999	37.2	28.0	27.3	23.9	25.2	29.2	29.0			
Rubber, leather, and plastic	3000-3199	26.8	26.1	30.2	23.8	23.5	26.1	25.9			
Stone, clay, and glass	3200-3299	32.0	28.4	24.0	25.5	28.6	29.5	25.1			
Primary metals	3300-3399	29.9	28.3	28.3	25.3	24.9	27.1	27.0			
Fabricated metals	3400-3499	26.2	27.6	33.3	32.7	30.4	29.7	22.7			
Machinery, exclude electric equipment	3500-3599	30.1	28.2	31.1	35.3	21.9	28.2	30.4			
Electric machinery	3600-3699	29.4	29.5	40.3	36.1	33.2	34.8	21.1			
Transportation equipment	3700-3799	21.3	24.1	24.4	27.6	27.2	24.3	24.3			
Instruments and misc manufacturing	3800-3999	26.9	28.9	28.6	29.4	27.0	28.8	21.1			
Public utilities	4900-4971	29.0	32.6	33.6	35.1	32.9	33.7	28.8			
Department stores	5310-5311	24.5	23.3	27.4	24.9	24.7	24.8	35.6			
Trade (wholesale)	5000-5271	26.2	27.9	25.2	24.1	22.3	26.5	21.0			
Trade (retail)	5300-5999	26.2	27.9	25.2	24.1	22.3	26.5	35.6			
Banks, finance	6000-6289	20.5	22.1	22.0	23.4	22.4	20.2	24.1			
Insurance	6300-6399	26.1	28.0	26.7	27.9	25.5	26.5	26.5			
Hospitals	8060-8069	20.2	23.1	22.3	20.9	22.3	22.8	22.9			
Misc. non-manufacturing	0100-1499; 4000-4789; 6400-8059; 8070-9721	27.6	28.3	28.0	29.5	28.5	29.2	32.8			
Construction	1500-1799	27.6	28.3	28.0	29.5	28.5	29.2	17.9			
Communications	4800-4899	27.6	28.3	28.0	29.5	28.5	29.2	12.6			

Note: Because no data were available for 1997, the averages of the prior years were used as a proxy.

Appendix E. Employee Benefits as Percent of Payroll, by Standard Classification System (SIC), Continued

Industry title	SIC	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total industry	9900-9999								27.7	28.1	27.9
Food, beverages, tobacco	2000-2141								23.1	25.1	24.1
Textile and wearing apparel	2200-2399								32.8	25.1	28.95
Pulp, paper, lumber & furn	2400-2679								24.9	24.7	24.8
Printing and publishing	2752-2796								20.8	25.2	23
Chemicals& allied products	2800-2899								27.9	28.7	28.3
Rubber, leather, and plastic	3000-3199								21.8	24.8	23.3
Fabricated metals	3400-3499								24	22.3	23.15
Machinery, exc electric equip	3500-3569								36.7	24.5	30.6
Other machinery	3580-3599								36.7	24.5	30.6
Computer, electronic,etc.	3570-3579								23.8	20.9	22.35
Electric machinery	3600-3699								23.8	20.9	22.35
Transportation equipment	3700-3728; 3732-3799								23.1	30.6	26.85
Other manufacturing	3800-3999; 8072; 2900-2999; 3210-3399								23.1	25.1	24.1
Construction	1500-1799								22.4	22.3	22.35
Public Utilities	4900-4911; 4924-4952; 4961-1971								36.3	32.1	34.2
Trade (retail)	5200-5271; 5310-5736; 5910-5999								16.2	28.1	22.15
Eating/Drinking/Hotels, etc.	5800-5813; 7010-7041								18.9	16.3	17.6
Trade (wholesale)	5000-5199								26	27.9	26.95
Banks, finance	6000-6289; 6722-6726								23.9	25.3	24.6
Insurance	6300-6411								23.9	25.3	24.6
Health Care	8011-8059; 8060-8069, 8071; 8080-8099; 8361								21	25.1	23.05
Information Services	2710-2741; 4810-4899; 7373-7379; 7383; 7810-7833; 8231								22.5	26.2	24.35
Professional Services	0741-0742; 8111;7311-7338; 7371; 7384; 7389; 6541; 8711-8748;								21.8		
Professional Services	0741-0742; 8111;7311-7338; 7371; 7384; 7389; 6541; 8711-8734									21.7	21.7
Mgmt Services	8740-8748									18.9	18.9
Transport dist/warehouse	3731; 4010-4492; 4499-4619; 4729-4789; 4922-4923								38.3	37.3	37.8
Social Assistance	8320-8351								21.7	26.2	23.95
Educational Services	8210-8222; 8243-8299								23.7	24.2	23.95
Arts, Entertainment, Rec	7900-7999; 8410-8422;									18.6	
Misc. non-manufacturing	010-0724; 0751-1499; 4493; 4724-4725; 4953-4959;6510-6553; 6710-6719; 6732-6799;7210-7299; 7342-7363; 7372; 7381-7382; 7500-7699; 7840-7999; 8399 -8699; 8810-9721								20.9		
Misc. non-manufacturing	0100-0724; 0751-1499; 4493; 4724-4725; 4953-4959; 6710-6719; 6732-6799;7210-7299; 7342-7363; 7372; 7381-7382; 7500-7699; 7840-7841; 8399;8610-8699; 8810-9721									36.8	36.8
Real Estate	6510-6531									23.5	23.5

Note: For individual cell data missing, the average of the surrounding years were a proxy and if there were no surrounding, data were derived by linear regression. If no data were available for an industry group over a period of years, the value from the aggregated level that included that missing industry group was used.
Source: U.S. Chamber of Commerce. *Employee Benefits*, years 1993-2002

Appendix F. Life-Cycle Wage Growth Rate by Age, Sex, and Race

	Male				Female			
Age	**Other**	**White**	**Black**	**Hispanic**	**Other**	**White**	**Black**	**Hispanic**
16	1.178421	1.1807463	1.1499645	1.1064308	1.110945	1.110392	1.1135419	1.0793468
17	1.178421	1.1807463	1.1499645	1.1064308	1.110945	1.110392	1.1135419	1.0793468
18	1.178421	1.1807463	1.1499645	1.1064308	1.110945	1.110392	1.1135419	1.0793468
19	1.178421	1.1807463	1.1499645	1.1064308	1.110945	1.110392	1.1135419	1.0793468
20	1.178421	1.1807463	1.1499645	1.1064308	1.110945	1.110392	1.1135419	1.0793468
21	1.178421	1.1807463	1.1499645	1.1064308	1.110945	1.110392	1.1135419	1.0793468
22	1.178421	1.1807463	1.1499645	1.1064308	1.110945	1.110392	1.1135419	1.0793468
23	1.178421	1.1807463	1.1499645	1.1064308	1.110945	1.110392	1.1135419	1.0793468
24	1.178421	1.1807463	1.1499645	1.1064308	1.110945	1.110392	1.1135419	1.0793468
25	1.0386253	1.0390839	1.0257374	1.0233834	1.0145462	1.013302	1.0110395	1.0121154
26	1.0386253	1.0390839	1.0257374	1.0233834	1.0145462	1.013302	1.0110395	1.0121154
27	1.0386253	1.0390839	1.0257374	1.0233834	1.0145462	1.013302	1.0110395	1.0121154
28	1.0386253	1.0390839	1.0257374	1.0233834	1.0145462	1.013302	1.0110395	1.0121154
29	1.0386253	1.0390839	1.0257374	1.0233834	1.0145462	1.013302	1.0110395	1.0121154
30	1.0386253	1.0390839	1.0257374	1.0233834	1.0145462	1.013302	1.0110395	1.0121154
31	1.0386253	1.0390839	1.0257374	1.0233834	1.0145462	1.013302	1.0110395	1.0121154
32	1.0386253	1.0390839	1.0257374	1.0233834	1.0145462	1.013302	1.0110395	1.0121154
33	1.0386253	1.0390839	1.0257374	1.0233834	1.0145462	1.013302	1.0110395	1.0121154
34	1.0386253	1.0390839	1.0257374	1.0233834	1.0145462	1.013302	1.0110395	1.0121154
35	1.0088495	1.0086268	1.0047512	1.0052981	1.0004308	1.0004565	1.0090623	0.9944325
36	1.0088495	1.0086268	1.0047512	1.0052981	1.0004308	1.0004565	1.0090623	0.9944325
37	1.0088495	1.0086268	1.0047512	1.0052981	1.0004308	1.0004565	1.0090623	0.9944325
38	1.0088495	1.0086268	1.0047512	1.0052981	1.0004308	1.0004565	1.0090623	0.9944325
39	1.0088495	1.0086268	1.0047512	1.0052981	1.0004308	1.0004565	1.0090623	0.9944325
40	1.0088495	1.0086268	1.0047512	1.0052981	1.0004308	1.0004565	1.0090623	0.9944325
41	1.0088495	1.0086268	1.0047512	1.0052981	1.0004308	1.0004565	1.0090623	0.9944325
42	1.0088495	1.0086268	1.0047512	1.0052981	1.0004308	1.0004565	1.0090623	0.9944325
43	1.0088495	1.0086268	1.0047512	1.0052981	1.0004308	1.0004565	1.0090623	0.9944325
44	1.0088495	1.0086268	1.0047512	1.0052981	1.0004308	1.0004565	1.0090623	0.9944325
45	0.9864074	0.9867512	0.9781418	0.9866475	0.9815216	0.9827107	0.9722566	0.9788427
46	0.9864074	0.9867512	0.9781418	0.9866475	0.9815216	0.9827107	0.9722566	0.9788427
47	0.9864074	0.9867512	0.9781418	0.9866475	0.9815216	0.9827107	0.9722566	0.9788427
48	0.9864074	0.9867512	0.9781418	0.9866475	0.9815216	0.9827107	0.9722566	0.9788427
49	0.9864074	0.9867512	0.9781418	0.9866475	0.9815216	0.9827107	0.9722566	0.9788427
50	0.9864074	0.9867512	0.9781418	0.9866475	0.9815216	0.9827107	0.9722566	0.9788427
51	0.9864074	0.9867512	0.9781418	0.9866475	0.9815216	0.9827107	0.9722566	0.9788427
52	0.9864074	0.9867512	0.9781418	0.9866475	0.9815216	0.9827107	0.9722566	0.9788427
53	0.9864074	0.9867512	0.9781418	0.9866475	0.9815216	0.9827107	0.9722566	0.9788427
54	0.9864074	0.9867512	0.9781418	0.9866475	0.9815216	0.9827107	0.9722566	0.9788427
55	0.9678103	0.9674387	0.9734898	0.9639941	0.9847603	0.9856224	0.9727295	0.9793205
56	0.9678103	0.9674387	0.9734898	0.9639941	0.9847603	0.9856224	0.9727295	0.9793205
57	0.9678103	0.9674387	0.9734898	0.9639941	0.9847603	0.9856224	0.9727295	0.9793205
58	0.9678103	0.9674387	0.9734898	0.9639941	0.9847603	0.9856224	0.9727295	0.9793205
59	0.9678103	0.9674387	0.9734898	0.9639941	0.9847603	0.9856224	0.9727295	0.9793205
60	0.9678103	0.9674387	0.9734898	0.9639941	0.9847603	0.9856224	0.9727295	0.9793205
61	0.9678103	0.9674387	0.9734898	0.9639941	0.9847603	0.9856224	0.9727295	0.9793205
62	0.9678103	0.9674387	0.9734898	0.9639941	0.9847603	0.9856224	0.9727295	0.9793205
63	0.9678103	0.9674387	0.9734898	0.9639941	0.9847603	0.9856224	0.9727295	0.9793205
64	0.9678103	0.9674387	0.9734898	0.9639941	0.9847603	0.9856224	0.9727295	0.9793205
65	0.9774616	0.9774221	0.9736104	0.9770608	0.9928663	0.993195	0.9830658	0.9836139
66	0.9774616	0.9774221	0.9736104	0.9770608	0.9928663	0.993195	0.9830658	0.9836139
67	0.9774616	0.9774221	0.9736104	0.9770608	0.9928663	0.993195	0.9830658	0.9836139

Appendix G. Annual Household Production Values by Age and Sex

Age	Male	Female	Age	Male	Female
16	5,299.80	5,799.85	45	10,716.40	15,366.50
17	5,299.80	5,799.85	46	10,716.40	15,366.50
18	6,088.20	11,081.40	47	10,716.40	15,366.50
19	6,088.20	11,081.40	48	10,716.40	15,366.50
20	6,088.20	11,081.40	49	10,716.40	15,366.50
21	6,088.20	11,081.40	50	10,716.40	15,366.50
22	6,088.20	11,081.40	51	10,716.40	15,366.50
23	6,088.20	11,081.40	52	10,716.40	15,366.50
24	6,088.20	11,081.40	53	10,716.40	15,366.50
25	8,792.85	13,873.65	54	10,716.40	15,366.50
26	8,792.85	13,873.65	55	12,647.25	16,939.65
27	8,792.85	13,873.65	56	12,647.25	16,939.65
28	8,792.85	13,873.65	57	12,647.25	16,939.65
29	8,792.85	13,873.65	58	12,647.25	16,939.65
30	8,792.85	13,873.65	59	12,647.25	16,939.65
31	8,792.85	13,873.65	60	12,647.25	16,939.65
32	8,792.85	13,873.65	61	12,647.25	16,939.65
33	8,792.85	13,873.65	62	12,647.25	16,939.65
34	8,792.85	13,873.65	63	12,647.25	16,939.65
35	10,278.40	15,665.80	64	12,647.25	16,939.65
36	10,278.40	15,665.80	65	13,870.00	16,571.00
37	10,278.40	15,665.80	66	13,870.00	16,571.00
38	10,278.40	15,665.80	67	13,870.00	16,571.00
39	10,278.40	15,665.80			
40	10,278.40	15,665.80			
41	10,278.40	15,665.80			
42	10,278.40	15,665.80			
43	10,278.40	15,665.80			
44	10,278.40	15,665.80			

Appendix H. Medical Care Consumer Price Index Adjustment Factors (Seasonally Adjusted)

Base Year	Initial Medical Care CPI	Target Year											
		1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
1992	190.1	1	0.944	0.901	0.862	0.833	0.810	0.785	0.759	0.729	0.697	0.666	0.640
1993	201.4	1.059	1	0.955	0.913	0.883	0.858	0.832	0.804	0.772	0.738	0.705	0.678
1994	211.0	1.110	1.048	1	0.957	0.925	0.899	0.872	0.842	0.809	0.773	0.739	0.710
1995	220.5	1.160	1.095	1.045	1	0.966	0.940	0.911	0.880	0.845	0.808	0.772	0.742
1996	228.2	1.200	1.133	1.082	1.035	1	0.973	0.943	0.911	0.875	0.837	0.799	0.768
1997	234.6	1.234	1.165	1.112	1.064	1.028	1	0.969	0.936	0.900	0.860	0.821	0.790
1998	242.1	1.274	1.202	1.147	1.098	1.061	1.032	1	0.966	0.928	0.887	0.848	0.815
1999	250.6	1.318	1.244	1.188	1.137	1.098	1.068	1.035	1	0.961	0.919	0.877	0.843
2000	260.8	1.372	1.295	1.236	1.183	1.143	1.112	1.077	1.041	1	0.956	0.913	0.878
2001	272.8	1.435	1.355	1.293	1.237	1.195	1.163	1.127	1.089	1.046	1	0.955	0.918
2002	285.6	1.502	1.418	1.354	1.295	1.252	1.217	1.180	1.140	1.095	1.047	1	0.961
2003	297.1	1.563	1.475	1.408	1.347	1.302	1.266	1.227	1.186	1.139	1.089	1.040	1

Source: U.S. Department of Labor Statistics/Bureau of Labor Statistics, Consumer Price Index (Medical Care Major Group)

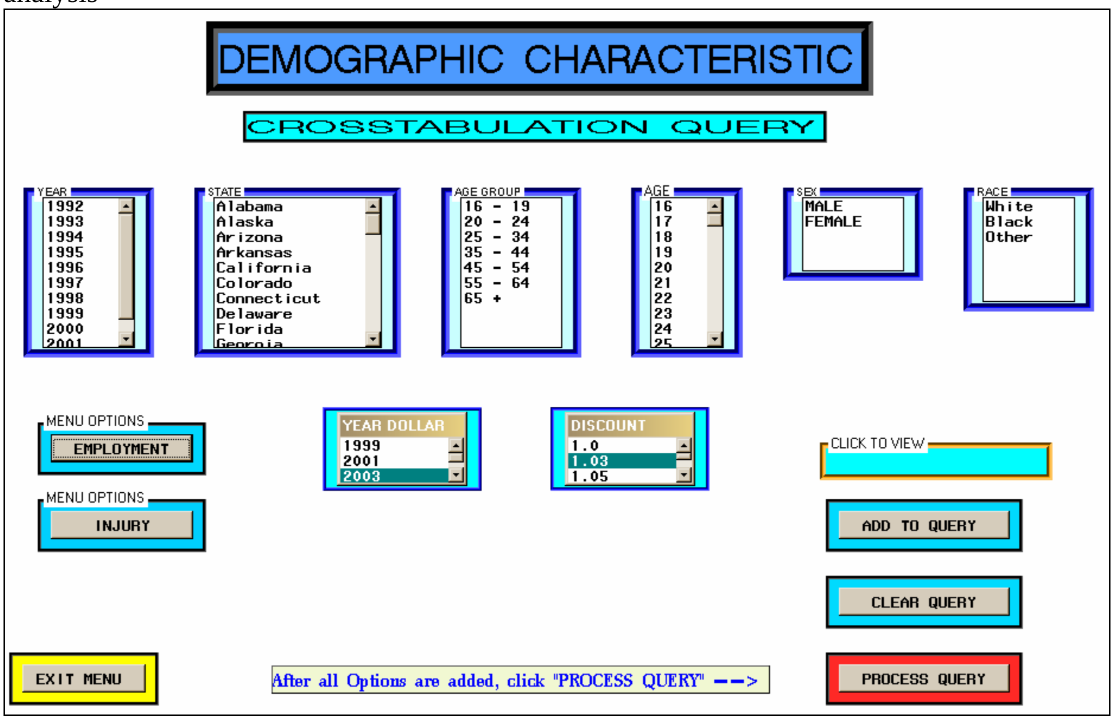
Appendix I. Example of Estimating the Cost of Traumatic Occupational Fatalities Based on Selected Characteristics

Screen One

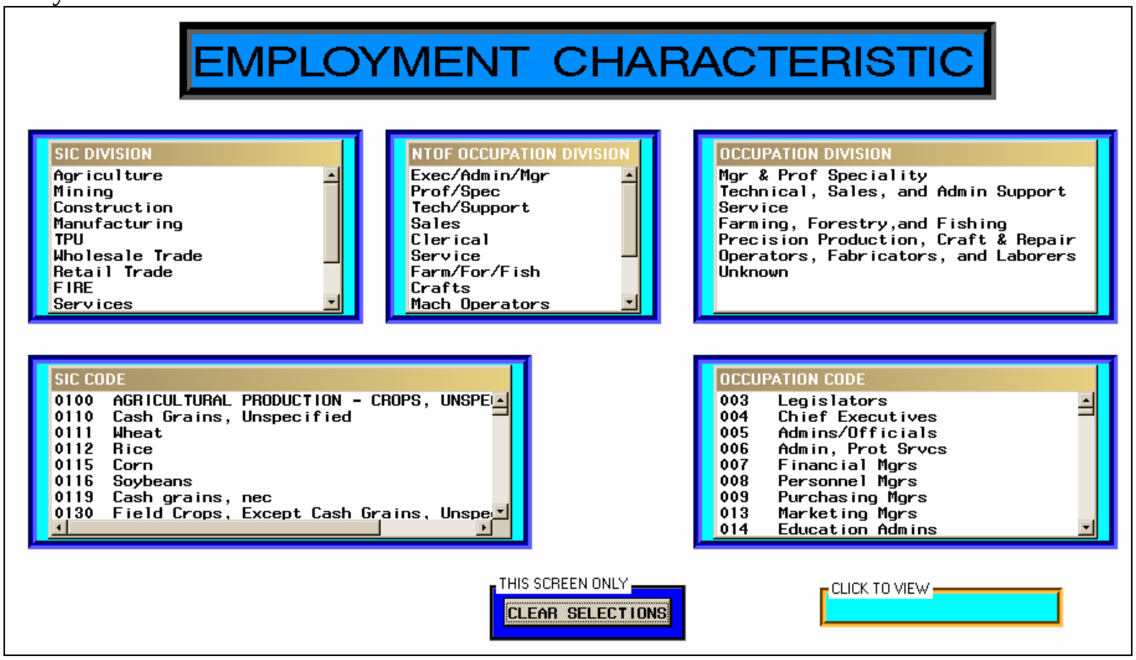
Select Costs/Frequency Tables to calculate the lifetime costs of fatal occupational injury

Screen Two

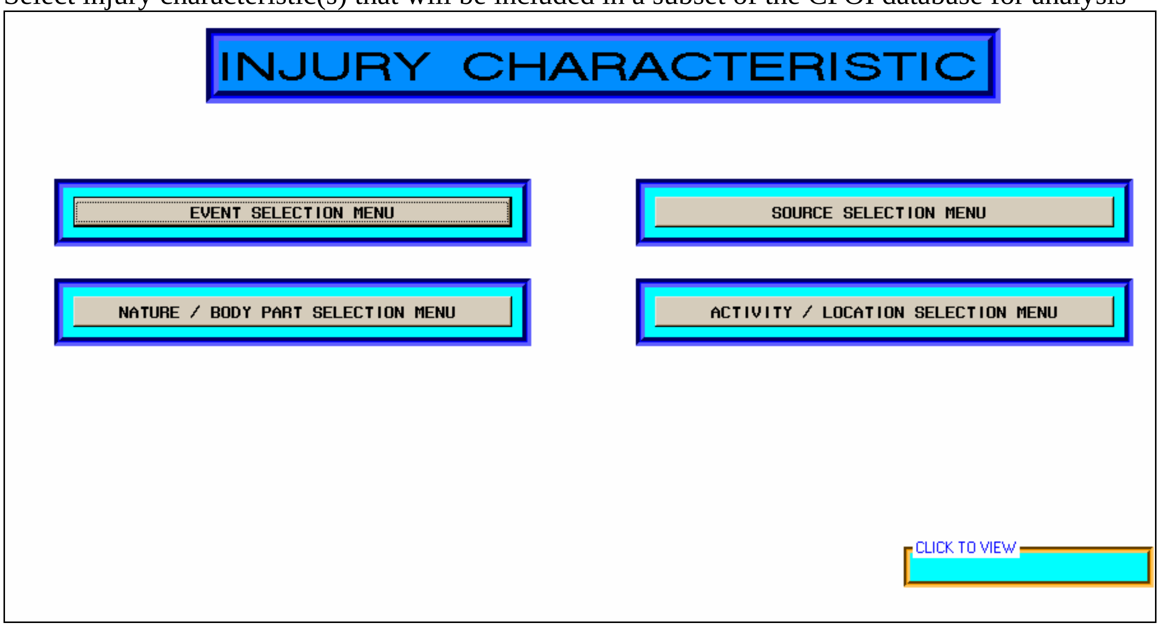
Select demographic characteristic(s) that will be included in a subset of the CFOI database for analysis



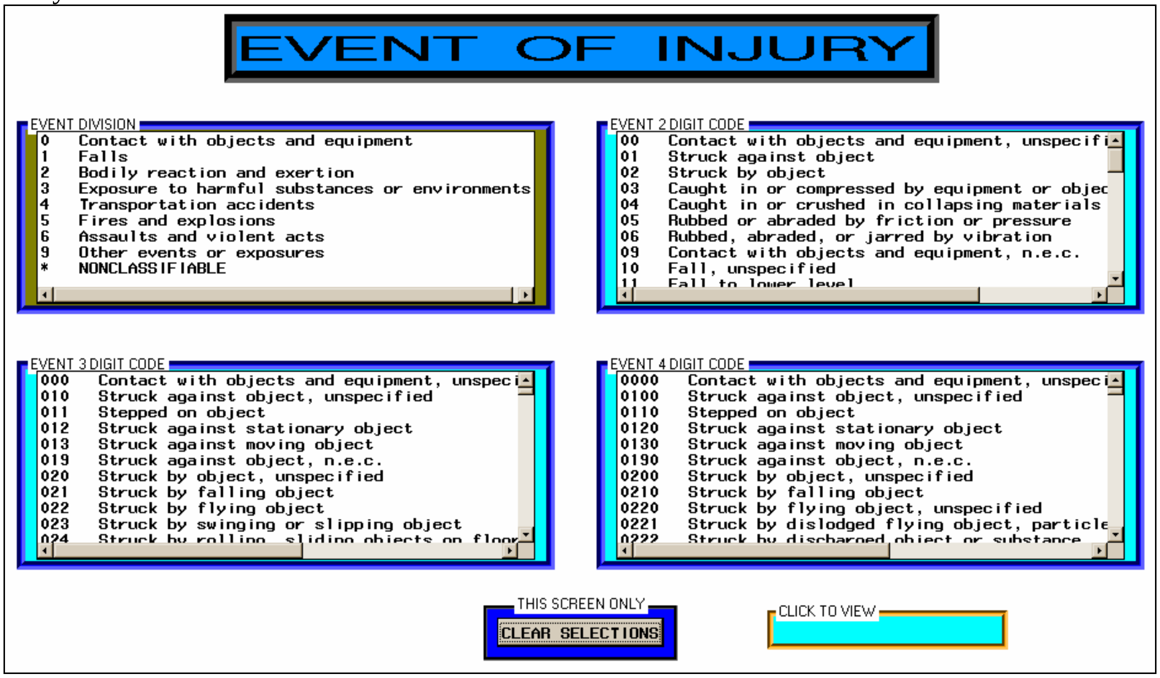
Screen Three
Select employment characteristic(s) that will be included in a subset of the CFOI database for analysis



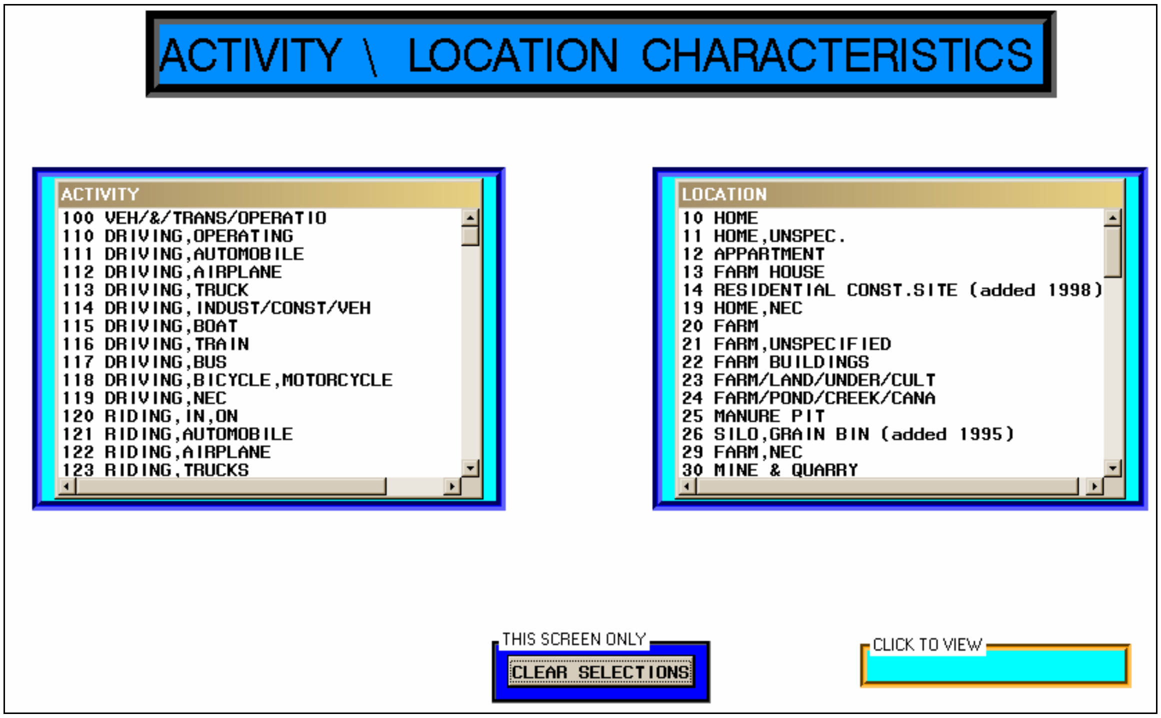
Screen Four
Select injury characteristic(s) that will be included in a subset of the CFOI database for analysis



Screen Five
Select event of injury category(ies) that will be included in a subset of the CFOI database for analysis

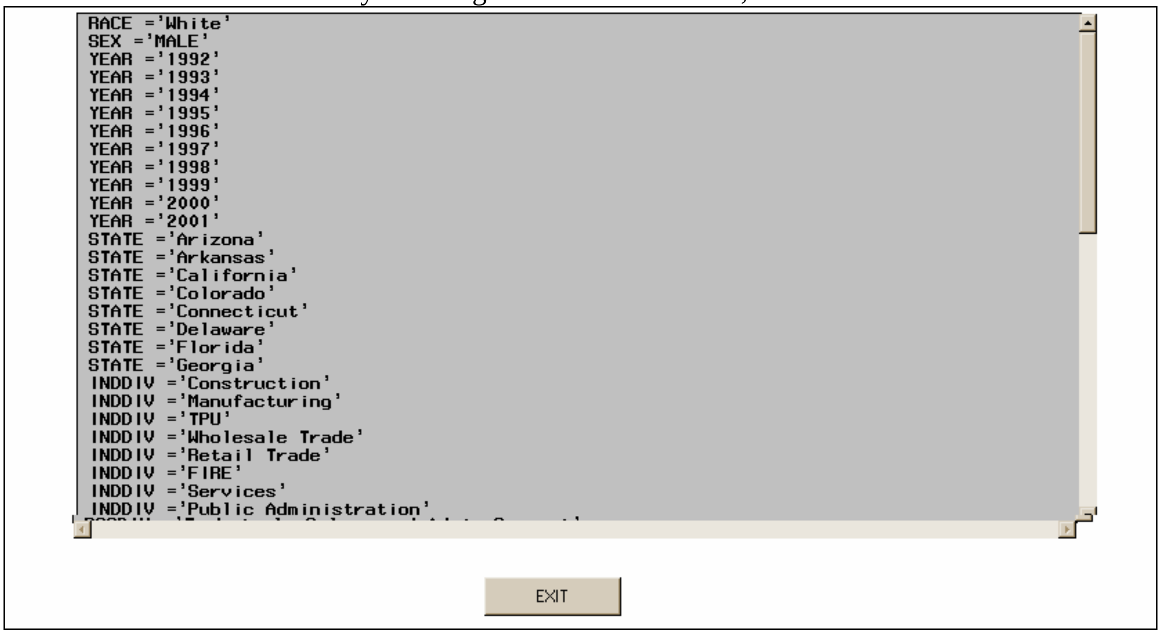


Screen Six
Select activity or location codes that will be included in a subset of the CFOI database for analysis



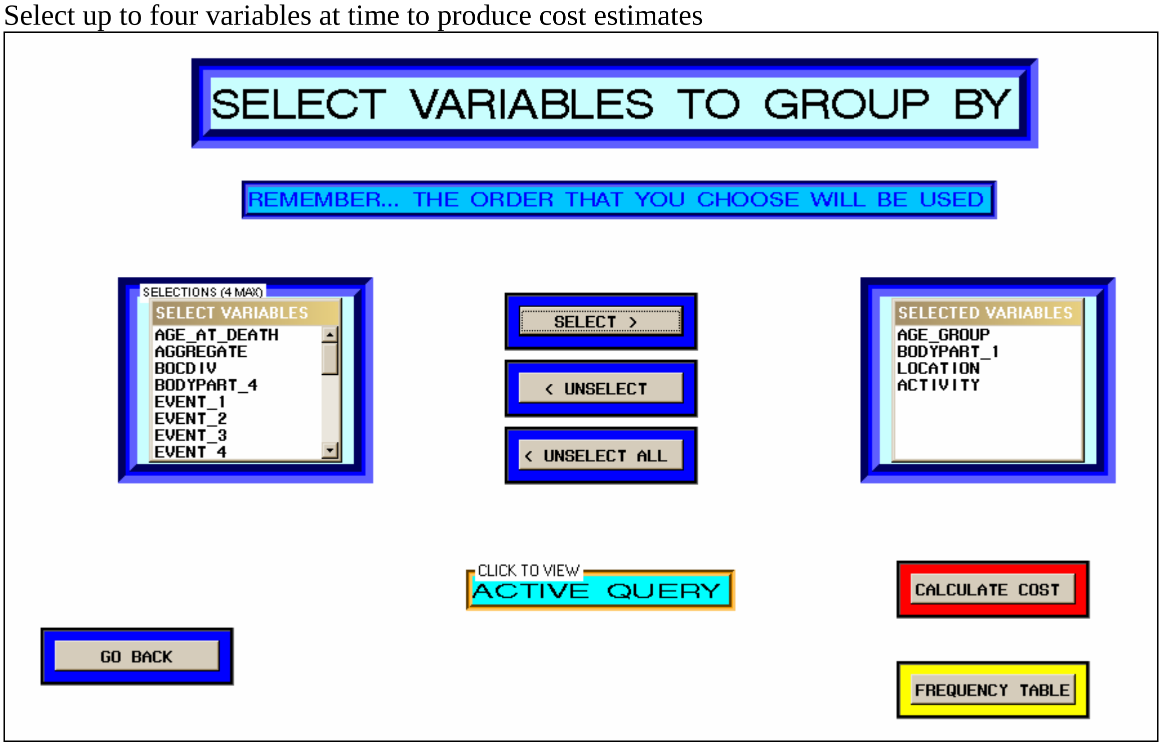
Screen Seven

Review the selection criteria by selecting Click to View button, then exit this screen



Screen Eight

Select up to four variables at time to produce cost estimates

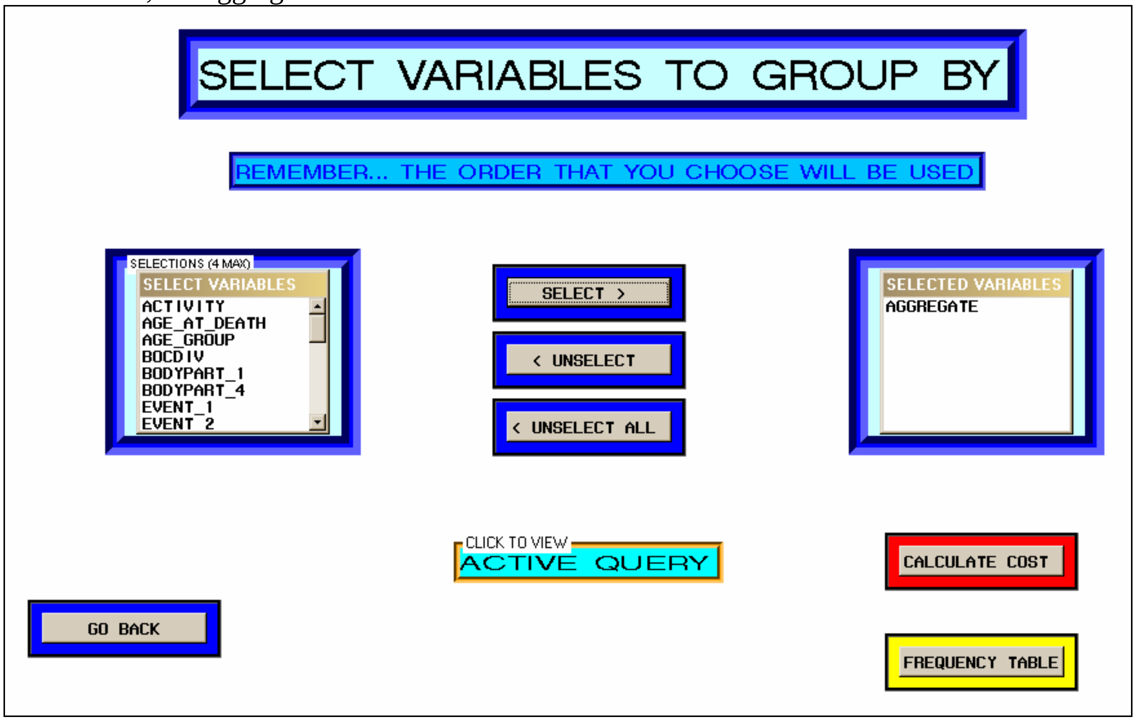


Screen Nine
The screen with the estimate provides a list of the variables selected for the database subset and then the cost estimates that were requested, including the year of dollar and discount rate (publication requirements prohibited providing many of the estimates

SUBSET
RACE ='White'
SEX ='MALE'
YEAR ='1992'
YEAR ='1993'
YEAR ='1994'
YEAR ='1995'
YEAR ='1996'
YEAR ='1997'
YEAR ='1998'
YEAR ='1999'
YEAR ='2000'
YEAR ='2001'
STATE ='Arizona'
STATE ='Arkansas'
STATE ='California'

Screen Ten

To illustrate, the aggregate variable was selected



Screen Eleven

A list of the variables selected for the database subset and then the cost estimates that were requested, including the year of dollar and discount rate

EVENT_1 ='1 Falls'
EVENT_1 ='2 Bodily reaction and exertion'
EVENT_1 ='3 Exposure to harmful substances or environments'
EVENT_1 ='4 Transportation accidents'
EVENT_1 ='5 Fires and explosions'
EVENT_1 ='6 Assaults and violent acts'

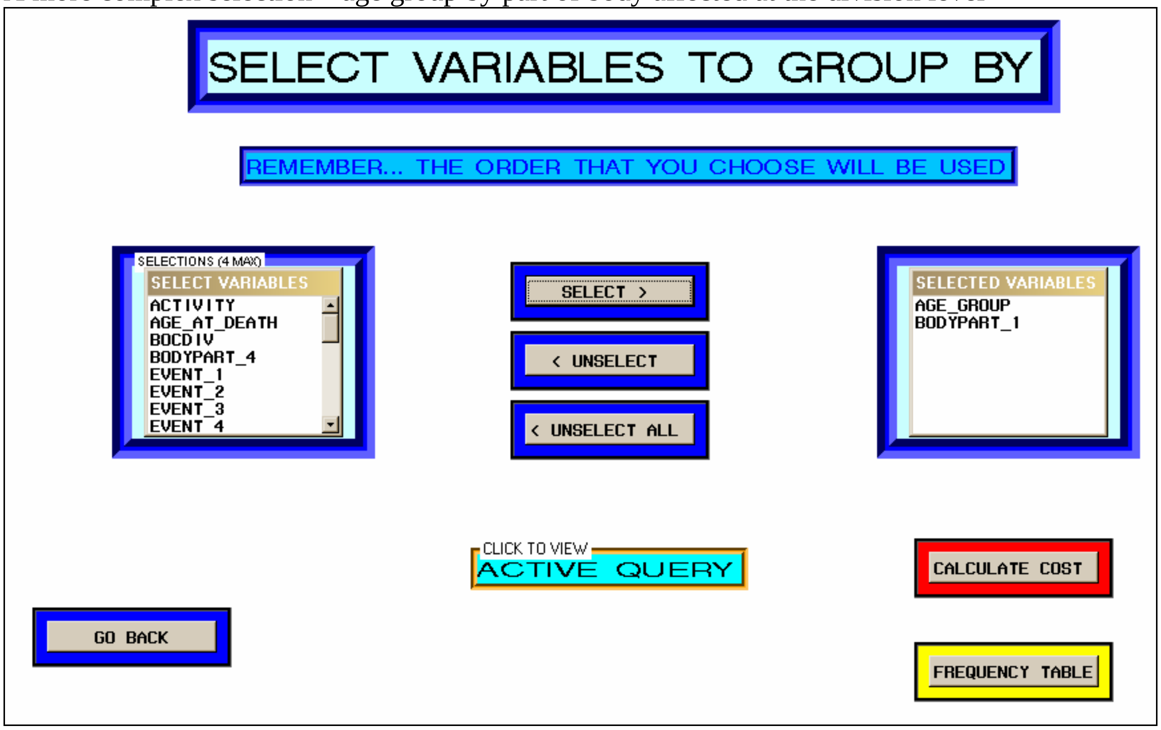
CROSSTABULATION TABLE BY (AGGREGATE)

AGGREGATE	FATALITIES	MEAN	MEDIAN	TOTAL
SUBSET TOTAL	8,120	854,613	873,452	6,939,454,056

DISCOUNT = 1.03 YEAR DOLLAR = 2003

Screen Twelve

A more complex selection—age group by part of body affected at the division level



Screen Thirteen

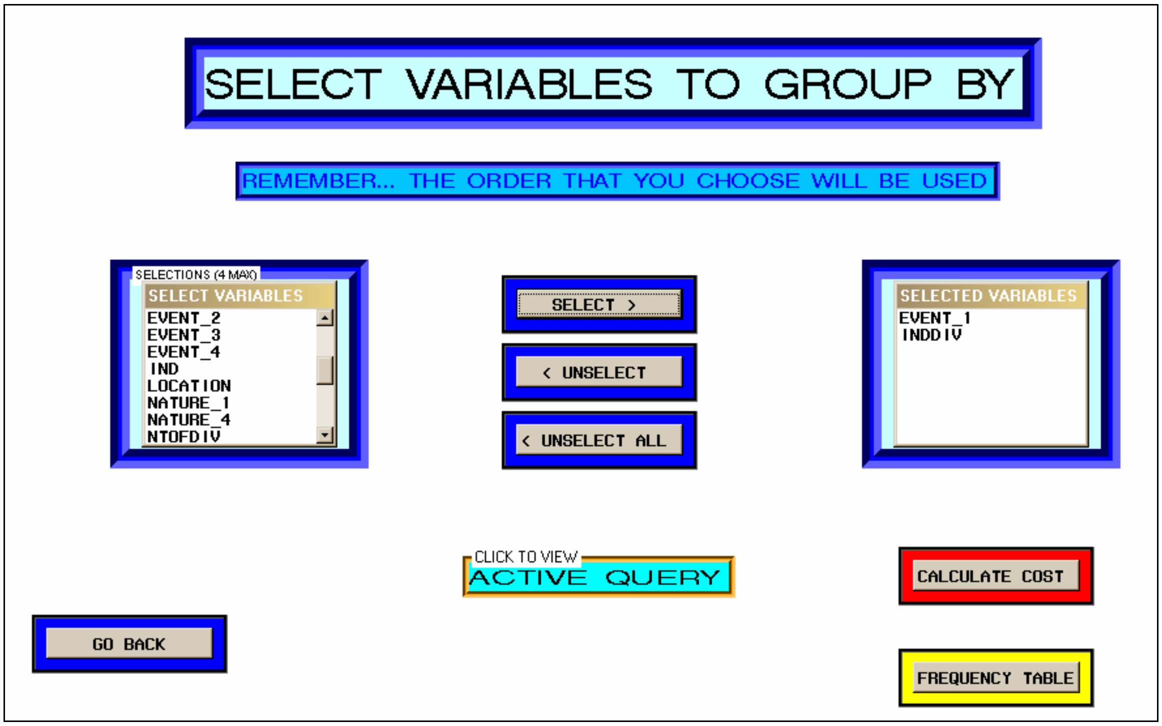
The estimation output in tabular format

CROSSTABULATION TABLE BY (AGE_GROUP BODYPART_1)

AGE_GROUP	BODYPART_1	FATALITIES	MEAN	MEDIAN	TOTAL
25 - 34	* Nonclassifiable	85	1,093,422	1,008,290	92,940,834
	0 Head	3,092	1,025,101	985,800	3,169,611,779
	1 Neck,Including Throat	229	1,037,342	1,010,502	237,551,414
	2 Trunk	2,170	1,007,336	978,979	2,185,919,468
	3 Upper Extremities	20	942,058	900,371	18,841,158
	4 Lower Extremities	70	1,016,173	959,953	71,132,104
	5 Body Systems	2,572	1,013,139	981,083	2,605,792,988
	8 Multiple Body Parts	4,427	1,102,139	1,029,668	4,879,168,226
35 - 44	* Nonclassifiable	92	1,067,596	1,007,457	98,218,825
	0 Head	3,460	1,039,029	994,459	3,595,038,905

DISCOUNT = 1.03 YEAR DOLLAR = 2003

Screen Fourteen
After selecting variables for estimation, selecting frequency table provides counts and percent distributions



Screen Fifteen
A list of the variables selected for the database subset is presented first, then the results based on your selections

*CROSSTABULATION TABLE BY (INDDIV*EVENT_1)*

The FREQ Procedure

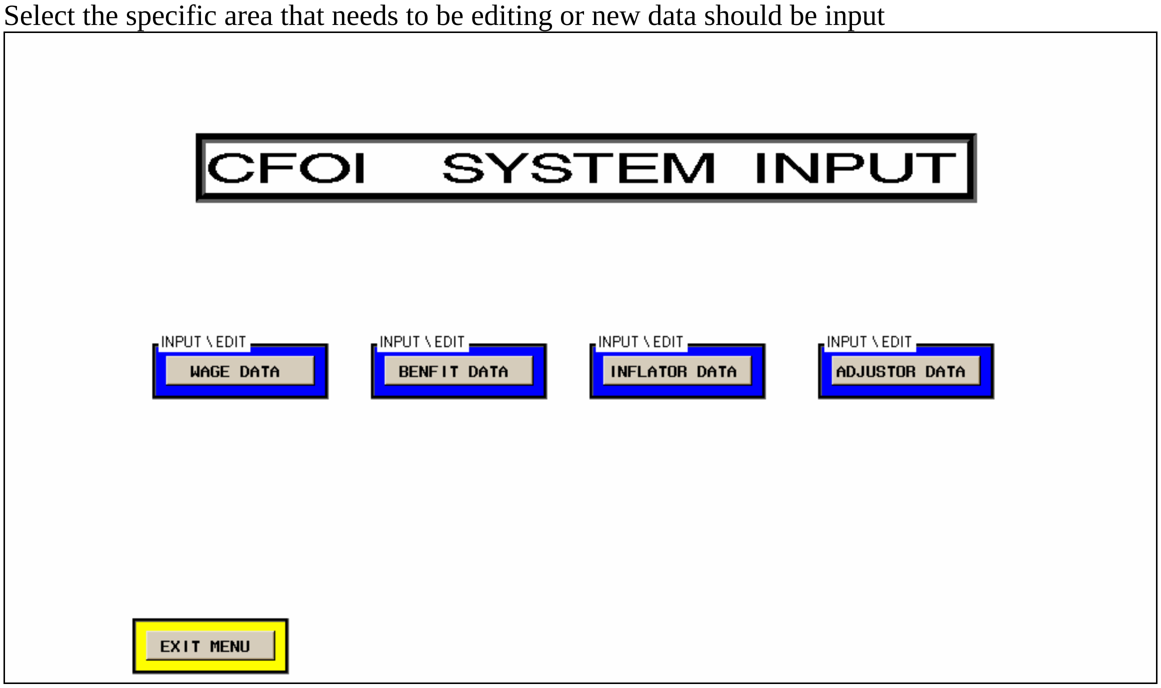
Frequency
Percent
Row Pct
Col Pct

Table of INDDIV by EVENT_1

INDDIV	EVENT_1: * Nonclassifiable	0 Contact with objects and equipment	1 Falls	2 Bodily reaction and exertion	3 Exposure to harmful substances or environments	4 Transportation accidents
Construction	17 0.09 0.16 51.52	2081 11.49 18.99 43.74	3366 18.59 30.71 85.04	20 0.11 0.18 33.33	1838 10.15 16.77 72.99	3030 16.73 27.64 59.00
Manufacturing	16 0.09 0.22 48.48	2677 14.79 37.47 56.26	592 3.27 8.29 14.96	40 0.22 0.56 66.67	680 3.76 9.52 27.01	2106 11.63 29.48 41.00
Total	33 0.18	4758 26.28	3958 21.86	60 0.33	2518 13.91	5136 28.37

Screen Sixteen
Selecting System Files provides a mechanism to make changes to the system files

Screen Seventeen
Select the specific area that needs to be editing or new data should be input



Curriculum Vitae

Elyce Anne Biddle

Professional Experience

2001-	Chief of Methods and Analysis Team, Division of Safety Research National Institute for Occupational Safety and Health, Centers for Disease Control, U.S. Dept. of Health and Human Services, Morgantown, WV.
1996-2001	Economist, Division of Safety Research, National Institute for Occupational Safety and Health, Centers for Disease Control and Prevention, U.S. Department. of Health and Human Services, Morgantown, WV.
1995-1996	Senior Labor Economist, Division of Occupational Pay and Employee Benefit Levels, Office of Compensation Levels and Trends, Bureau of Labor Statistics, U.S. Department of Labor, Washington, DC.
1985-1995	Senior Economist, Division of Safety, Health, Program Analysis and Control, Office of Safety, Health and Working Conditions, Bureau of Labor Statistics, U.S. Department of Labor, Washington, DC.

Education

PhD	2004	West Virginia University, Morgantown, WV: Occupational Safety and Health
MS	2001	West Virginia University, Morgantown, WV: Agricultural and Resource Economics
MBA	1985	University of New Mexico, Albuquerque, NM: Business (35 hours completed in the "3/2" program)
BA	1985	University of New Mexico, Albuquerque, NM: Economics (Summa Cum Laude)

Summary of Honors and Professional Service

National Institute for Occupational Safety and Health, NORA, Social and Economic Consequences of Workplace Injury and Illnesses, Member	2004-pres
International Association of Industrial Accident Boards and Commissions, Accident Prevention, Benefits and Cost Containment Committee	2003-pres
Federal Interagency Review Group operating at the behest of John Graham, OMB charged with providing review and guidance on Circular A-4, Regulatory Analysis, invited member	2003
Centers for Disease Control and Prevention, Health Economics Research Group, Elected Member of Steering Committee	2001-pres
National Institute for Occupational Safety and Health, NORA, Social and Economic Consequences of Workplace Injury and Illnesses; Co-Team Leader	1997-2002
Center to Protect Workers' Rights, Economic Research Network, National Institute for Occupational Safety and Health Representative	1996-pres
American National Standards Institute (ANSI) Z-16 Committee Member	1996-pres
Centers for Disease Control and Prevention and Agency for Toxic Substances and Disease Registry, Quality of Worklife Committee, Chairperson	1997-2001

Professional Associations

American Society of Safety Engineers
Economic Educators Association
Eastern Economic Association
Western Economic Association
International Society for Quality of Life Studies

Leadership Activities

Economic Evaluation of Occupational Safety and Health Interventions at the Company Level, Work Group Coordinator	2004-pres
Economic Evaluation of Occupational Safety and Health Interventions at the Company Level Symposium, Organizing Committee/Chair Planning Committee	2004
NIOSH Economic Interest Group, Chair	2000-pres
Morgantown Partnership Council	2000-2002
Centers for Disease Control and Prevention, Exec Partnership Council,	2000-2002
Measuring the Burden of Injuries (Organized with the World Conference on Injury Prevention and Safety Promotion), Program Committee	2000, 2002, 2004, 2006
Eastern Economic Association Annual Meeting, Program Committee	1999; 2001
CDC/ATSDR Quality of Work Life Committee, Chair	1998-2000
NORA, Social and Economic Consequences of Workplace Illness and Injury, Co-Team Leader	1997-2002
BLS Activity 3 Quality Council, Member	1994-1996
BLS Quality of Work Life Steering Committee, Co-Chairperson	1993-1996
Coding Interpretations Committee, Chairperson	1992-1996

Publications

Schulte, PA, AH Okun, CM Stephenson, J Palassis, and E Biddle. "Integrating Occupational Safety and Health Information and Training into Vocational and Technical Education and Other Workforce Preparation Programs," American Journal of Public Health, March 2005.

Biddle, E. "Changes in Economic Analysis for Social Regulation in the U.S., Measuring the Burden of Injury, August 2004.

Biddle, E. "Economic Cost of Fatal Occupational Injuries in the United States, 1980-1997," Contemporary Economic Policy: Vol. 22, No. 3, July 2004, 370-381.

Biddle, E. and S Marsh. "Comparison of the National Traumatic Occupational Fatalities and Census of Fatal Occupational Injuries Surveillance System," <u>Journal of Safety Research</u> , 33: 337-354, 2002,

Hartley, D. and E Biddle. "The Burden of Occupational Fatal Injury for Older Workers in the United States" <u>Injury Insights</u>, 1-2, 11 June/July 2002.

Biddle, E. and D Hartley. "Fire- and Flame-Related Events with Multiple Occupational Injury Fatalities in the United States, 1980-1995", <u>Injury Control and Safety Promotion</u>, 9(1): 9-18, 2002.

Hartley, D. and E. Biddle. "Will Risks to Older Workers Change in the 21st Century?" HERA 7(7):1885-1894, 2001.

Biddle, E. "NIOSH Efforts to Identify and Fill Information Gap" CIDR Vol 1, Issue 4, February, 2001.

Boden, L., E Biddle, and E Spieler. "Social and Economic Impacts of Workplace Illness and Injury: Current and Future Directions for Research," The American Journal of Industrial Medicine 40:398-402, 2001.

Biddle, E. "Database of Databases" CIDR Vol 1, Issue 3, November, 2000.

Biddle, E. and D Hartley. "Fire- and Flame-Related Occupational Fatalities in the United States, 1980-1994", Journal of Occupational and Environmental Medicine, Vol. 42, No. 4, April 2000.

Biddle, E. and L Blanciforti. "Impact of a Changing U.S. Workforce on the Occupational Injury and Illness Experience", American Journal of Industrial Medicine, Supplement 1, September, 1999.

Biddle, E. and S Kisner. "Denominator Effects on Traumatic Occupational Fatality Incidence Rates", Statistical Bulletin, Jan-Mar 1998.

Biddle, E. "Development and Application of an Occupational Injury and Illness Classification System", ILO Encyclopaedia of Occupational Health and Safety, Fourth Edition, Geneva:ILO, 1997.

Biddle, E. "Standardized Coding of Occupational Injuries and Illnesses", Appendix E, Occupational Injuries and Illnesses: Counts, Rates, and Characteristics, 1992, April 1995.

"Standardized coding of occupational injuries and illness", Fatal Workplace Injuries in 1992: A Collection of Data and Analysis, April 1994.

"Profiles in Safety and Health: Fabricated Structural Metal", Monthly Labor Review, December 1991.

"Injury and Illness Data Available from 1988 Workers' Compensation Records", DOL Announcement 90-2, September 1990.

"Injury and Illness Data Available from 1987 Workers' Compensation Records", DOL Announcement 90-1, May 1990.

"Nursing Home Aides Experience Increase in Serious Injuries" , Monthly Labor Review, February 1990.

"Job Hazards Underscored in Woodworking Study", Monthly Labor Review, September 1989.

"Occupational Injuries and Illnesses, 1984 "Occupational Injuries and Illnesses in the United States by Industry, 1984, May 1986.

Selected Presentations

"Economic Evaluation of Occupational Health and Safety Interventions at the company Level". Invited presentation for the NORA Liaison Committee Meeting, December 2004.

New Directions for Economic Research at NIOSH". Invited presentation for the Center to Protect Workers' Rights, December 2004.

"The Why, What, When, and How of Economic Evaluation" and chair of the "Economic Analysis and Evaluation Research" session. For the Steps to a Healthier U.S. Workforce, October 2004.

"The Impact of Occupational Fatal Injuries on the U.S. Gross Domestic Product". Invited presentation for the International Association of Industrial Accident Boards and Commissions meeting. August 2004.

"Changes in Economic Analysis for Social Regulation in the U.S". Invited presentation for the 5th International Conference on Measuring the Burden of Injury, June 2004.

"The Lifetime Cost of Occupational Fatal Injuries in Mining". Invited presentation for the 2004 Society for Mining, Metallurgy, and Exploration Annual Meeting & Exhibit, February 2004.

"Economics Research in Occupational Safety and Health at NIOSH". Invited presentation for the Economics Department at the University of Utah, February 2004.

"Measuring the Economic Burden of Occupational Fatal Injuries in the United States". For the National Occupational Injury Research Symposium, October 2003.

"Fatal Occupational Injury Costs: Results From Two U.S. Surveillance Systems". For the National Occupational Injury Research Symposium, October 2003.

"Prevention and Control of Occupational Injury through Economic Analysis". Special session for Western
Economic Association, July 2003. Specific presentations presented or co-authored included: Occupational Fatal Injury Societal Cost: A State Pilot Study; Willingness-to-Pay Pilot Study: Alaskan Commercial Fishermen Safe Workplace; Fatal Occupational Injury Costs Using Two U.S. Fatality Databases; Evaluation of Washington State Apprenticeship and Training Program.

"Tracking the Cost of Injury: An Employer's Perspective". Invited presentation for the 4th International Conference on Measuring the Burden of Injury, May 2002.

"The Cost of Workplace Homicides in the United States, 1980-1997". For the 6th World Conference on Injury Prevention and Control, May 2002

"The Burden of Occupational Fatal Injury on Working Women in the United States, 1980-1997". For the Eastern Economic Association, March 2002.

"Measuring the Economic Burden of Occupational Injuries in the United States, 1990-1995". For the National Occupational Injury Research Symposium, October 2000.

“Impact of a Changing U.S. Workforce on the Occupational Injury Experience, 1980-1994". For the National Occupational Injury Research Symposium, October 2000.

“Reaching Consensus on Quality of Life and Economic Outcomes of Injury”. For the 3rd International Conference Measuring the Burden of Injury, May 2000.

“Modeling the Economic Burden of Occupational Fatal Injuries in the United States, 1990-1995”. For the Eastern Economic Association, March 2000.

“Classifying Occupational Injuries and Illnesses: Evolution of the Current System”. Invited presentation for the 13th Annual California Conference on Childhood Injury Prevention, October 1999.

“Classifying Occupational Injuries and Illnesses”. For the National Conference on Health Statistics, August 1999.

“Searching for the Gaps: the NORA Effort”. Invited presentation for the Economic Research Network of the Center to Protect Workers’ Rights, November, 1999 and for the NIOSH/NORA Federal Liaison Committee, September, 1999.

“Project Evaluation within NIOSH”. For WVU Department of Agricultural and Resource Economics, December 1998.

“Methods in Social and Economic Analysis”. Invited presentation for the Allergic and Irritant Dermatitis National Occupational Research Agenda Implementation Team, December 1998.

“Impact of a Changing U.S. Workforce on the Occupational Injury and Illness Experience”. For the 7th Joint Science Symposium on Occupational Safety and Health, October 1998.

“Safety of Women in the Workplace”. For the Eastern Economic Association, February 1998.

“Introduction to OIICS Coding Structure”. For the Insurance Data Management Association and American National Standards Institute Seminar on Injury Coding, January 1998.

“Selecting an Appropriate Quality of Life Adjustment Index”. For the International Society for Quality of Life Studies, November 1997.

Invited panelist for peer review for Consumer Product Safety Commission Cost of Injury Model, June 1997.

Invited discussant for Economics of Ergonomics for Managing Ergonomics in the 1990's: A discussion of the science and policy, June 1997.

“Occupational Deaths Associated with Accidents Caused by Fire and Flames: 1980-1992". For the National Safety Council, November 1996

"Implementation of COMP2000 Wage Levels System". For the Dept. of Labor and Cities of Albuquerque, NM; Allentown, PA; Rochester, NY, Salt Lake City, UT, 1996.

"Application of the Occupational Injury and Illness Classification System". Invited presentation for OSHA, Defense Logistic Agency, and EPA; 1992-1995.

"Using the Occupational Injury and Illness Classification System". Invited presentation for NIOSH, December 1994.

"Linear regression: an applications approach". For the Department of Labor, Bureau of Labor Statistics, Division of International Training; requested speaker for multiple presentations for international labor officials from 1992-1994.

"Standardized coding of occupational injuries and illnesses". For the American Statistical Association, August 1993.

"The good, the bad, and the useful of the Occupational Injury and Illness Classification System", Department of Labor, October 1993.

"Analysis of labor statistics for policy formulation in the human resources sector". For Department of Labor, Bureau of Labor Statistics, November 1990.

"How BLS defines and captures occupational injury and illness data". For Department of Labor, Bureau of Labor Statistics, Division of International Training; multiple invited presentations focusing on statistical methods for international labor officials from 1987-1990.

"Recordkeeping requirements under the Occupational Safety and Health Act of 1970 and 29 CFR 1904". Invited presentations for nationwide effort to inform employers of legal requirements under the Act sponsored by the National Safety Council (19 different sessions), 1987-1989.

Publications in Process

"Deriving Occupational Fatal Injury Costs: A State Pilot Study". (in review for submission to Compensation and Working Conditions)

"Trucking Safety in the Age of Information". (in review for Trucking in the Age of Information, Ashgate Publishing Ltd.)

"Lifetime Costs of Fatal Injury in the Mining Industry, 1980-1997". (submitted to Journal of Safety Research, 2004.

"Societal Cost of Workplace Homicides in the United States, 1992-2001". (submitted to .American Journal of Industrial Medicine).

"The Role of NIOSH in Productivity Evaluation: Health and Safety in the Workplace" in Health and Work Productivity: Emerging Issues in Research and Policy. University of Chicago Press. (in publication, 2004).