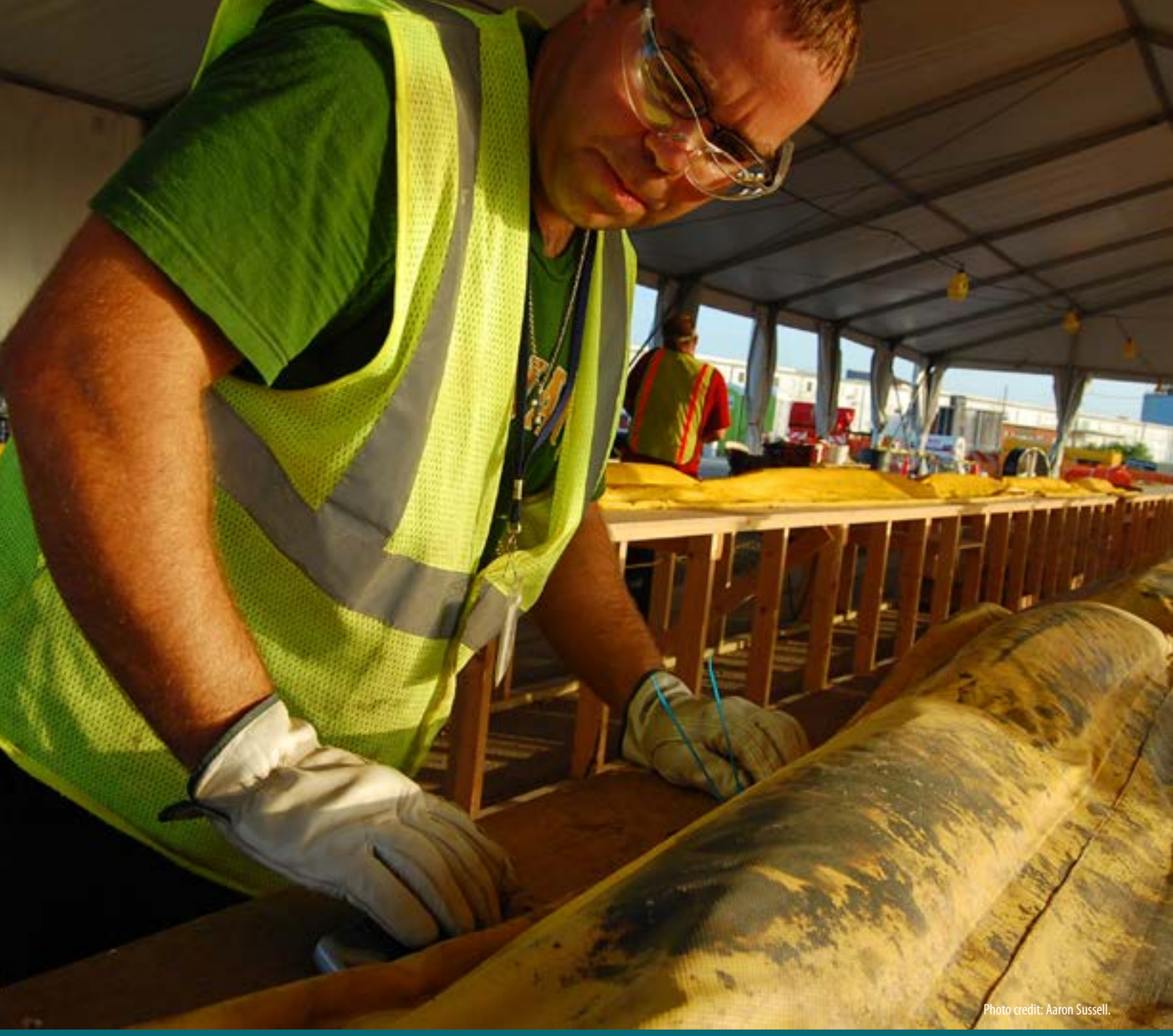
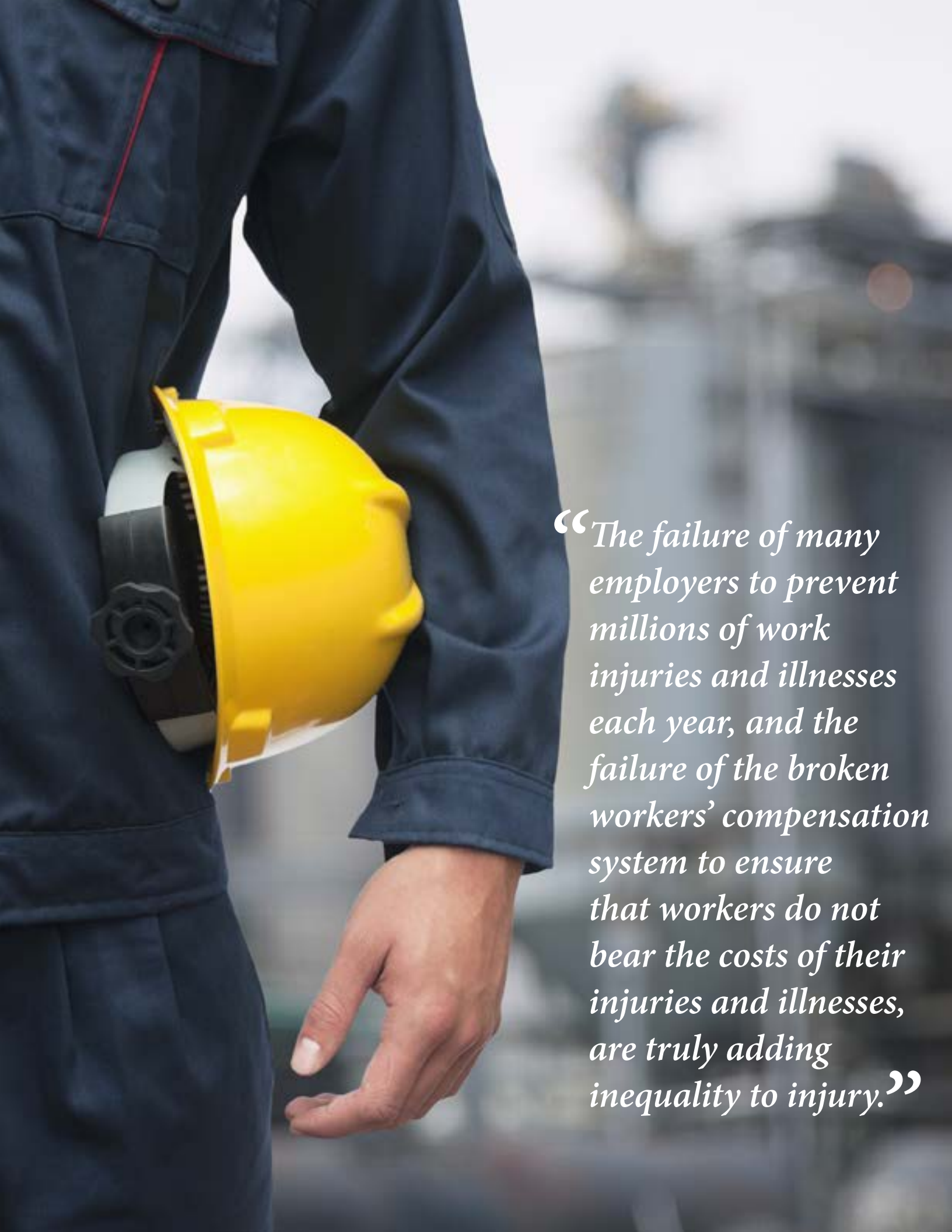


Photo credit: Aaron Sussell.

ADDING INEQUALITY TO INJURY: THE COSTS OF FAILING TO PROTECT WORKERS ON THE JOB

OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION
UNITED STATES DEPARTMENT OF LABOR



"The failure of many employers to prevent millions of work injuries and illnesses each year, and the failure of the broken workers' compensation system to ensure that workers do not bear the costs of their injuries and illnesses, are truly adding inequality to injury."

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Executive Summary

Work injuries and illnesses exact a tremendous toll on society. Despite the decades-old legal requirement that employers provide workplaces free of serious hazards, every year, more than three million workers are seriously injured, and thousands more are killed on the job. The financial and social impacts of these injuries and illnesses are huge, with workers and their families and taxpayer-supported programs paying most of the costs.

For many injured workers and their families, a workplace injury creates a trap which leaves them less able to save for the future or to make the investments in skills and education that provide the opportunity for advancement. These injuries and illnesses contribute to the pressing issue of income inequality: they force working families out of the middle class and into poverty, and keep the families of lower-wage workers from entering the middle class. Work injuries hamper the ability of many working families to realize the American Dream.

The costs of workplace injuries are borne primarily by injured workers, their families, and taxpayer-supported components of the social safety net. Changes in state-based workers' compensation insurance programs have made it increasingly difficult for injured workers to receive the full benefits (including adequate wage-replacement payments and coverage for medical expenses) to which they are entitled. Employers now provide only a small percentage (about 20%) of the overall financial cost of workplace injuries and illnesses through workers' compensation. This cost-shift has forced injured workers, their families and taxpayers to subsidize the vast majority of the lost income and medical care costs generated by these conditions.

Important changes in the structure of the employment relationships in U.S. workplaces are also exacerbating the incidence and consequences of work injuries. The pervasive misclassification of wage employees as independent contractors and the widespread use of temporary workers have increased the risk of injury and the number of workers facing financial hardships imposed by workplace injuries. The change in employment relationships also reduces the incentives for companies to assume responsibility for providing safe working conditions, which may result in increased overall risk of workplace injury.

The most effective solution to the problem posed by this paper is to prevent workplace injuries and illnesses from occurring. This would spare workers and their families from needless hardship and suffering, as well as the loss of income and benefits associated with these conditions. At the same time, it is vitally important that state-based workers' compensation programs take steps to eliminate roadblocks that prevent workers with compensable injuries or illnesses from receiving the full compensation to which they are entitled.

The failure of many employers to prevent millions of work injuries and illnesses each year, and the failure of the broken workers' compensation system to ensure that workers do not bear the costs of their injuries and illnesses, are truly adding inequality to injury.

Work injuries and illnesses impose heavy costs on workers, families and the economy

Forty-four years after Congress passed the Occupational Safety and Health Act of 1970, requiring employers to provide workplaces "free from recognized hazards that are causing or likely to cause death or serious physical harm" to their workers,[1] the toll of workplace injuries, illnesses and fatalities in the United States remains unacceptably high. The Bureau of Labor Statistics (BLS) reports that approximately 4,500 workers are killed on the job each year. BLS estimates that employers record nearly three million serious occupational injuries and illnesses annually on legally mandated logs.[2] Recordable workplace injuries and illnesses range in severity from wounds, amputations, back injuries and other serious condition requiring care beyond first aid (injuries receiving only first aid are not recordable) to fatal injuries. About half of recorded injuries require at least a day away from work, a job transfer or a work restriction for recovery.[3]

While the estimate of three million serious work-related injuries each year may seem extremely high, it is undoubtedly only a fraction of the true number. Numerous studies provide documentation that many, and perhaps the majority, of work-related injuries are not recorded by employers, and that the actual number of workers injured each year is likely to be far higher than the BLS estimate.[4]

Trying to estimate the burden of work-related illnesses is complicated further by the fact that many chronic illnesses occur long after exposure has ended and are generally not identified as work-related. However, studies have estimated that approximately 50,000 annual U.S. deaths are attributable to past workplace exposure to hazardous agents, such as asbestos, silica and benzene.[5] In comparison, about 33,000 people died in traffic crashes in the United States in 2013.[6]

The economic costs of these occupational injuries and illnesses are enormous. The National Safety Council, for example, estimates the cost of fatal and non-fatal work injuries at $198 billion in 2012.[7] Compare this cost to the estimated costs of dementia (Rand Corporation estimates the annual costs of dementia, including Alzheimer's, in 2010 was between $159 billion and $215 billion) and of diabetes (2012 costs were estimated by the American Diabetes Association at $245 billion).[8]

In concept, employer-provided workers' compensation insurance covers lost wages, first dollar (no co-pay) medical expenses, and rehabilitation costs associated

with work-related injuries. The coverage is actually quite limited, however. A recent study found that workers in New Mexico who receive workers' compensation benefits for wage loss caused by workplace injuries lose an average of 15 percent of the earnings they would have been expected to earn over the 10 years following the injury. Even with workers' compensation benefits, injured workers' incomes are, on average, almost $31,000 lower over 10 years than if they had not been injured. This figure does not reflect the even more substantial losses suffered by the many injured workers who never enter the workers' compensation system.[9]

For workers and their families, economic and non-economic losses because of work injuries are inevitable, and some are difficult to measure. These costs have greater impact on lower-wage workers. For example, following a worker injury, family caregivers must often reduce their own hours of work and wages to care for

"Statistics are People with the Tears Washed Off"

Reports and studies based primarily on statistical analyses mask the experiences of real people, aspects of whose complex lives are measured and then quantified in the statistics. This is certainly true of the workers and families coping with the consequences of work injuries and illnesses. Workers trying to support their families after suffering a disabling injury face daunting challenges, and statistics alone cannot convey their experiences and the difficulties they face. Here is one example:

Robert worked for a Virginia employer that manufactured foam insulation. He climbed on a foam grinder to clean out some material and the manager turned on the machine. His right foot was pulled and mangled by the machine. Robert has had multiple surgeries, and must wear a special boot to walk. After his injury, Robert and his wife Jessica could no longer save money toward a new home. The family lived in a shelter until they found a new apartment, mold-ridden and infested with fleas. Jessica wrote to President Obama:

> *"My husband lives with constant chronic pain every day of the week and he tosses and turns throughout the night. As soon as he wakes up in the morning he has to put on this 'boot' in order to do anything. This boot stays on his foot all day long because he is unable to walk without it on. Before being injured my husband played basketball or football every single day and he ran and played outside with our two toddler sons. He was a weight lifter and a fisherman and a hunter, these are all things he can no longer partake in due to his injuries from work. One of our sons took off towards the road, running full speed one day and I was seven months pregnant and all my husband could do was yell at me and watch from his wheelchair as I scurried as fast as possible to grab my son before he went into the road.*
>
> *"His life the way he lived it was robbed from him and he will never be the same. We have three children, Evan who is three-and-a-half, Tristan who is two-and-a-half, and their new sister Halley who is three months old, my husband is unable to be the kind of father that so many people wish to be due to his injuries. He cannot be the 'man' that so many men are not, because of his limitations. We are struggling financially so badly because of this 'accident' and the negative effect it has had on his pay.*
>
> *"We wish to have answers to why there are so many laws in Virginia to protect the employers, when in cases like this, if the employer had done THEIR job enforcing OSHA regulations, accidents like the one my husband was involved in would never happen."*

a disabled partner or family member. For working families already struggling to meet basic necessities and set aside some savings, a work injury to a primary wage earner can be especially devastating. There are also less tangible effects that are important but impossible to monetize. Workplace injuries can diminish self-esteem and self-confidence, increase stress between spouses, children and other family members, and strain relations with friends, colleagues and supervisors. These indirect costs can translate into tangible economic costs, including lower wages.[10]

Lower wage workers like Robert also disproportionately bear the burden of occupational injuries and illnesses. Many lower-wage jobs (defined as jobs whose median wages do not raise a family of four above the poverty line) are also high-hazard jobs, and low-wage workers are injured on the job at a disproportionate rate.[11]

Stagnant wages have forced some wage earners, especially those supporting a family, into holding two or more jobs. Beyond its detrimental impact on family life, long work days lead to worker fatigue and increase the risk of both work-related and non-work-related injuries, as well as of motor vehicle crashes.[12]

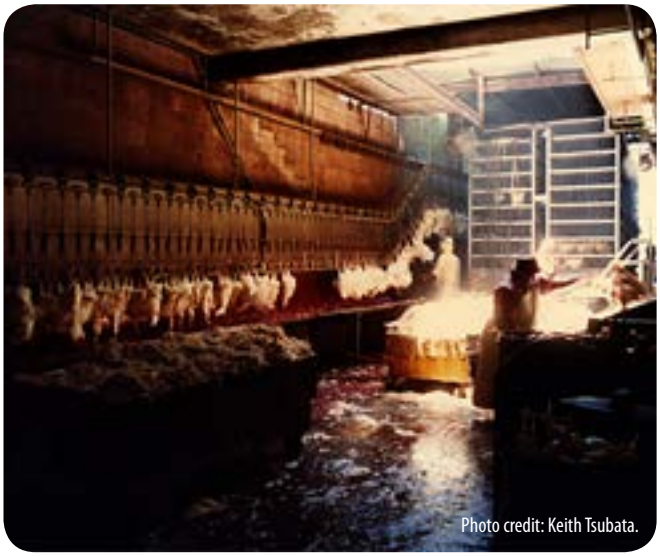


Photo credit: Keith Tsubata.

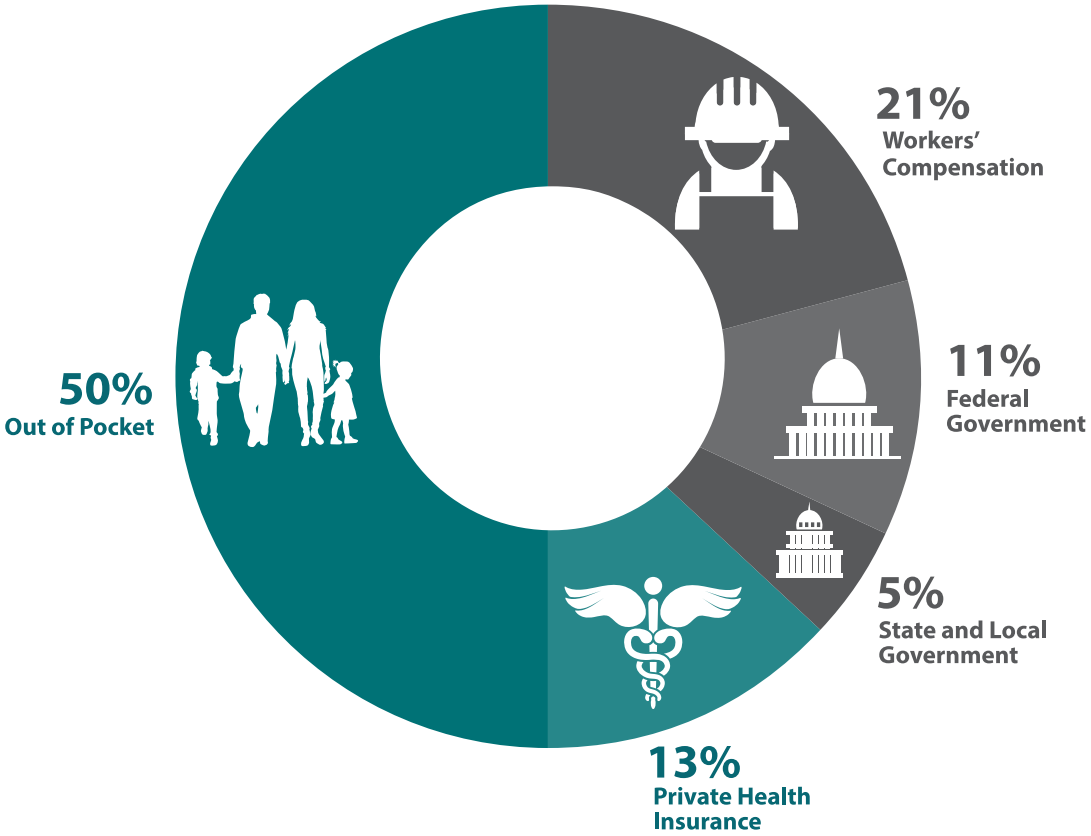
Injured workers and taxpayers subsidize high hazard employers

The workers' compensation systems created in each state were originally intended to have employer-provided insurance reimburse workers for lost wages while providing first-dollar medical coverage and rehabilitation for work-related injuries. Under this "no-fault" system, workers have lost the right to sue their employer, but, in theory, have gained relatively certain access to benefits following their injury.

In reality, the costs of workplace injury and illness are borne primarily by injured workers, their families, and taxpayer-supported safety-net programs. State legislatures and courts have made it increasingly difficult for injured workers to receive the payments for lost wages and medical expenses that they deserve.[13] As a result of this cost-shifting, workers' compensation payments cover only a small fraction (about 21 percent) of lost wages and medical costs of work injuries and illnesses; workers, their families and their private health insurance pay for nearly 63 percent of these costs, with taxpayers shouldering the remaining 16 percent.

Moreover, only a fraction of injured workers receive any workers' compensation benefits through state workers' compensation programs. Several studies have found that fewer than 40 percent of eligible workers

Who bears the cost of worker injuries?[14]



Fewer than 40% of eligible workers apply for workers compensation benefits[15]

apply for any workers' compensation benefits at all.[15] Indeed, recent BLS-supported analyses that match cases reported to workers' compensation carriers with those cases recorded by their employer on OSHA logs, treated in emergency rooms or admitted to hospitals, found a sizable proportion of injured workers receive no benefits through the workers' compensation system. For example, a review of all recordable work-related amputations in Massachusetts found that less than 50 percent of the cases received any workers' compensation benefits.[16] A similar California study found that one-third of workers who had amputations that were recorded by their employers had not received workers' compensation benefits. That same study also found that one-third of workers with employer recorded carpal-tunnel syndrome had not received workers' compensation.[17]

While this system proves inadequate for the average worker, the workers' compensation system performs even more poorly for low-wage workers. Many face additional barriers to filing, including even greater job insecurity, lack of knowledge about their rights, or a limited command of English. OSHA staff members have encountered many injured immigrant workers who have not filed for workers' compensation out of fear of losing their jobs. These barriers are documented in numerous surveys of low-wage and immigrant workers who report being injured on the job and not filing workers' compensation claims.[18]

The challenges facing individuals with work illnesses are even greater than for those with injuries. Few workers with occupational illnesses receive any benefits from the workers' compensation system; one study estimates that as many as 97 percent of workers with occupational illness are uncompensated.[19] Most cases of work-related chronic disease are never diagnosed as work-related. When a linkage is made, the diagnosis generally comes long after employment ends. Even when a proper diagnosis is made, a worker who is eligible for benefits under Medicare, Medicaid, Veterans' Benefits or private insurers is more likely to take that route, and avoid the barriers to obtaining benefits through the workers' compensation system.[20]

The changing structure of work in the U.S. increases risk of injury and contributes to income inequality

Several trends in the labor market today create even greater challenges to worker safety and health. These trends include the increased presence of employees of multiple employers at the same worksite, the pervasive misclassification of wage employees as independent contractors and the widespread use of temporary employees provided by labor staffing agencies.

If several firms employ workers at the same site, and employers do not actively collaborate to ensure safe workplaces, all workers at the site may be a higher risk of injury. Although this pattern of employment has been true in the construction industry for many years, it has now become more common in other sectors of the economy. More and more, workers are not actual employees of the employer who owns or controls the workplace where they work. Instead, they may be employed by a contractor or subcontractor, or by a staffing agency.[21] This trend has a significant, negative impact on the safety and health of U.S. workers To address this, OSHA often cites employers for endangering the employees of other employers working at the same jobsite.

Misclassification of employees as independent contractors also increases the risks for these individuals. In the construction industry, the proportion of the workforce misclassified as independent contractors is substantial, although the illegality of misclassification makes researching this topic challenging. Researchers associated with the McClatchy newspaper chain recently studied this topic and estimated that in Texas, 37.7 percent of all construction workers were misclassified as independent contractors. They reported smaller but still substantial proportions of misclassified of construction workers in North Carolina (35.2 percent) and Florida (15.5 percent). The researchers estimated that in these three states alone, more than 500,000 construction workers were misclassified as independent contractors.[22]

Misclassifying workers increases the likelihood of work injuries through two mechanisms. First, by misclassifying wage employees as independent contractors, employers do not have to worry about the OSHA requirement to provide a safe workplace, since the OSHA law does not cover the self-employed. Second, these employers avoid paying workers' compensation insurance premiums (as well as unemployment insurance and other benefits and taxes). The misclassifying employer is no longer concerned about workers' compensation premiums rising following a work injury, so is less likely to invest in safety. The result is increased risk of work injuries at workplaces where employees have been misclassified, and, when those injuries do occur, the injured workers, their families and the taxpayer bear the costs, subsidizing the employer's hazardous operations.

This misclassification hurts not only workers, but also employers who follow the law. These honest employers are put at a disadvantage, having to compete with scofflaws who ignore safety and health requirements, and shirk paying taxes, benefits and insurance premiums.[23]

The increased employment of temporary workers also increases the risk of work injuries. Temporary workers, often employed through staffing agencies, are generally at the worksite for shorter time periods. Researchers in the state of Washington found temporary workers in the construction and manufacturing sectors had twice

the rate of injuries of workers in standard employment relationships. For each injury, they lost more days from work than the other workers. At the same time, temporary workers received less medical and time loss reimbursement payments for their injuries.[24]

Why are temporary workers likely at greater risk of injury? There are several factors. New workers often lack adequate safety training and are likely to be unfamiliar with the specific hazards at their new workplace. As a result, new workers are several times more likely to be injured in the first months on the job than workers employed for longer periods.[25] Consistent with these findings, OSHA has investigated numerous incidents in recent months in which temporary workers were killed on their first days on a job.[26]

Temporary workers are also likely to be newly assigned to unfamiliar workplaces multiple times in any given year and may carry this increased risk as long as they are in the temporary workforce. For employers, there is less financial incentive to invest training resources on temporary employees because shorter tenure will yield a lower return on investment than similar investments for permanent employees. OSHA has encountered many situations, including some in which temporary workers have been killed, in which employers have chosen to not provide required safety training to temporary workers. And the temporary workers themselves, recognizing the precarious nature of their employment, are less likely to complain to their employers, or to OSHA, about the existence of even serious hazards.[27]

While lacking a financial incentive to train temporary employees, employers do have a financial incentive to contract out their most dangerous jobs. For many employers, the state's workers' compensation premiums are experience-rated, meaning that, in general, employers with fewer claims pay lower premiums. In theory, this experience rating provides some financial incentive for employers to invest in safety to prevent injuries and lower insurance premiums. By assigning workers employed by a staffing agency to the most dangerous tasks, host employers may hope to avoid higher premiums.[28]

These trends in the labor market also minimize the incentive to provide a safe workplace that exists when an employer who controls the workplace also bears financial responsibility for worker injuries. This is particularly true with temporary workers employed through staffing agencies. Host employers have primary control of the temporary employees' work environments, but the host employers generally have no financial responsibility when temporary workers are injured, since those workers are covered by staffing agencies' insurance policy. This shift in risk is likely to reduce investments in safety and health and create more hazardous workplaces, increasing the number of injuries among both temporary workers and any permanent workers whom they work alongside. Given the practice of outsourcing the more hazardous jobs, and the lower wages of temporary workers, lower-wage workers have the most to lose in this new reality.

As noted earlier, temporary workers are less likely to be compensated for their injuries, making matters worse. Temporary workers say they are more hesitant to report their injuries and claim compensation, out of concern their employer (the staffing agency) will not assign them additional work, or out of confusion as to which employer is responsible. The result is that injured temporary workers are less likely to receive workers' compensation benefits than permanent workers. As a result, neither the temporary staffing agency nor the employer whose work is being performed by temporary workers bears the cost of workplace injuries. Instead, the cost of the injury is shifted completely to the workers, their families and the taxpayers.

Occupational injuries and illnesses strain social insurance programs and result in taxpayer subsidies of unsafe employers

The costs of workplace injuries are massively subsidized by injured workers, their families and the taxpayer-supported components of the social safety net. As discussed above (and presented in Figure One), employers cover only a small percentage of the overall cost of workplace injuries and illnesses through the workers' compensation system; injured workers, their families and taxpayers bear the vast majority of the lost income and medical care costs generated by these conditions. Federal and state programs pick up 16 percent of the overall costs of occupational injuries and illnesses; through Medicare and Medicaid alone, taxpayers pay almost 19 percent of the medical costs of these conditions.[29]

This proportion of the costs of work injuries and illnesses covered by working families and taxpayers has likely risen in recent years, as many state legislatures and courts have implemented changes in their workers' compensation systems that make it more difficult for injured workers to obtain benefits.[30] The number of Social Security Disability Insurance (SSDI) beneficiaries and the amount of benefits paid by that program has also grown dramatically in recent years. An accumulating body of evidence shows that at least part of the growth in SSDI benefit payments is attributable to the program's subsidy for work injuries and illnesses. In one study, for example, 20.5 percent of the participants in the 1992 Health and Retirement Study, a nationally representative sample of the U.S. population aged 51 to 61, reported having a health problem that limits the kind or amount of work they can do. Among those who reported some disability, 36 percent report having become disabled because of an accident, injury,

Photo credit: Marsha Mitchell.

or illness at work. Among the entire population sample, 6 percent were enrolled in SSDI, and 37 percent of this group of recipients reported they were disabled as a result of a work-related condition. Extrapolating these findings to overall SSDI and Medicare expenditures, the study's authors estimated that these two tax-payer supported safety net programs subsidized workplace injuries with $33 billion in benefits in 2001 alone.[31]

For more evidence of SSDI subsidizing work injury costs, consider a recent study which found that New Mexico workers experiencing lost-time work injuries (for which they received some workers' compensation benefits) have a substantially increased likelihood of becoming SSDI recipients, even after controlling for personal and work characteristics. This is particularly true among the lower-wage workers in the study, who were more likely to have experienced a lost-time work injury, and more likely to become an SSDI recipient, than were the higher-wage workers. The researchers calculated that experiencing a lost-time work injury has the same impact on the risk of becoming a SSDI recipient as aging 10 years. As a consequence, those SSDI recipients who experienced lost-time injuries are likely to receive SSDI benefits at younger ages,

increasing the costs and the length of time for which they receive SSDI. Extrapolating the New Mexico experience to the country as a whole, 7 percent of the roughly one million people who became new SSDI beneficiaries in 2010 became disabled as a result of a work injury. The cost to the SSDI program is substantial: each annual cohort of workers with these lost-time work injuries who become SSDI recipients increases SSDI expenditures by roughly $12 billion, and adding Medicare costs nearly doubles this amount.[32] The magnitude of this subsidy strains the ability of social insurance programs to provide adequate benefits to claimants.

The shifting of cases and costs from workers' compensation to SSDI and Medicare also creates subsidies that may reduce employer financial incentives to prevent work-related injury and illness. As with the shift of workers' compensation coverage from host employer to staffing agency, the overall failure of the workers' compensation system to provide benefits to injured workers, as well as the shifting of the costs from the employer responsible for the injury to the taxpayer, means that any financial incentive from experience rating that encourages high-hazard employers to invest in injury prevention, is lessened or eliminated.

The most effective solution: greater efforts to prevent work injuries and illnesses

The enormous number of workplace injuries and illnesses, the cost-shifting away from state workers' compensation, and the fissuring of U.S. workplaces all increase the burdens on workers and their families, place significant stress on the social safety net, and contribute to income inequality. The costs of injuries not compensated through workers' compensation or through the social safety net increase financial burden on injured low-wage earners and their families, tightening existing financial constraints and making it even more difficult for low-wage workers to support basic family needs, much less pursue education or other investments that increase future opportunities and earning potential.

The most effective solution to the problem posed by this paper is, of course, to prevent workplace injuries and illnesses from occurring in the first place. This is what is required by the law, and it would spare workers and their families from needless hardship and suffering, as well as from the loss of income and benefits associated with these conditions.

Reduction in the number of work injuries and illnesses would also have a significant impact on healthcare system costs, reducing expenditures for hospitalizations and other medical care. (The National Safety Council estimates the medical costs of work injuries alone were approximately $55 billion in 2012.[33])

Over the past several decades, the U.S. has made great strides in reducing the incidence of workplace injuries, illnesses and fatalities. In 1970, an estimated 14,000 workers were killed on the job, an annual rate of 18 per 100,000 or about 38 workers killed on the job every day.[34] Today, with a far larger workforce, that rate has fallen to 3.4 per 100,000, or about twelve every day.[35] While this represents great progress, twelve deaths a day is still twelve too many.

More can, and must, be done. The acceptable number of work injuries, especially fatal work injuries, is zero. Many employers strive to prevent all injuries and illnesses while others do not. Within a given industry, there is often substantial variation in worksite-specific injury rates, evidence of the tremendous variation in the presence or effectiveness of an employer's injury prevention program. For example, the average DART (more serious injuries or illnesses, the ones that result in Days Away, Restricted work activity or job Transfer) rate among nursing care facilities in 2012 was 5.2 per 100 workers. One-quarter of the nation's nursing care facilities had DART rates less than or equal to 0.8, while the rates of employers in the highest quartile were above seven per 100 workers, or more than eight times higher than the rates of the nursing care facilities in the lowest quartile.[36] Similar disparities in injury risk can be seen in international comparisons. The work fatality rate in the United Kingdom is about one-third the rate of the United States and the rate in constructio¬n is about one-quarter the U.S. rate. While the rates in both countries are decreasing, the difference between the rates has grown substantially since the 1990s as construction work has become far safer in the United Kingdom than in the United States.[37]

At the same time, it is vitally important that the state-based workers' compensation systems take steps to eliminate roadblocks that prevent workers with compensable injuries or illnesses from receiving the full benefits (including adequate wage-replacement payments and full coverage for medical expenses) to which they are entitled. Currently, workers with work-related injuries or illnesses who are successful in claiming workers' compensation receive only a small portion of the true costs of their injury or illness, and


Photo credit: Hsiang-Jen Yen.

many others who are entitled to benefits receive no workers' compensation benefits at all. Without ending this unfair and unwarranted income loss, these workers will never be able to catch up to the income level they maintained before their injury or illness.[38]

Further, by forcing the costs of injury and illness onto workers, their families and the taxpayer, unsafe employers have fewer incentives to eliminate workplace hazards and actually prevent injuries and illnesses from occurring. Under this broken system, these workers, their families and the tax-payer subsidize unsafe employers, increasing the likelihood that even more workers will be injured or made sick.

Serious workplace injuries are devastating to the injured workers, their families and communities. Low-wage workers and their families are particularly impacted by injuries: unless we as a society take steps to address these issues, many of these people will continue to find it difficult to enter or remain in the middle class, and safety net programs like SSDI will be strained providing benefits to all the beneficiaries entitled to receive them.

In summary, despite a more-than-40-year-old legal obligation to provide safe workplaces, the unwillingness of many employers to prevent millions of work injuries and illnesses each year, and the failure of the broken workers' compensation system to ensure that workers do not bear the costs of their injuries and illnesses, are truly adding inequality to injury.

Endnotes

[1] Occupational Safety and Health Act of 1970, 29 U.S.C. 651-678. The specific requirement of employers to provide workplaces "free from recognized hazards that are causing or likely to cause death or serious physical harm" (OSHA's General Duty Clause) is 29 U.S.C. 654(a)(1).

[2] Census of Fatal Occupational Injuries Summary, 2013 (2014, September 11). *U.S. Bureau of Labor Statistics.* Retrieved February 11, 2015 from http://www.bls.gov/news.release/cfoi.nr0.htm.

[3] Employer-Reported Workplace Injury and Illness Summary. (2013, November 7). *U.S. Bureau of Labor Statistics.* Retrieved February 8, 2015 from http://www.bls.gov/news.release/osh.nr0.htm; Nonfatal Occupational Injuries and Illnesses Requiring Days Away From Work, 2013 (2013, November 26). *U.S. Bureau of Labor Statistics*. Retrieved February 8, 2015, from http://www.bls.gov/news.release/osh2.nr0.htm.

[4] Rosenman KD, Kalush A, Reilly MJ, et al. How much work-related injury and illness is missed by the current national surveillance system? *Journal of Occupational and Environmental Medicine* 2006; 48:357-365; Boden LI, Ozonoff A. Capture–recapture estimates of nonfatal workplace injuries and illnesses. Annals of Epidemiology 2008; 18:500-506. To begin to understand the workplace injury undercount, BLS has commissioned a series of studies that match the work injuries recorded by employers with those that have led to a workers' compensation award or that can be identified through hospital or clinic records. These studies suggest that the BLS estimates do not include a substantial proportion of workplace injuries identified in other data sets, with a capture rate ranging between 40 and 70%, depending on the type of establishment and nature of the injury. For the mechanisms through which injuries and illness fail to be recorded by employers, see Azaroff LS, Levenstein C, Wegman DH. Occupational injury and illness surveillance: Conceptual filters explain underreporting. *American Journal of Public Health* 2002; 92:1421-1429. For more on the efforts of BLS to examine the undercount, see Ruser JW. Examining evidence on whether BLS undercounts workplace injuries and illnesses. *Monthly Labor Review* 2008:20-33; Wiatrowski WJ. Examining the completeness of occupational injuries and illnesses: an update on current research. *Monthly Labor Review* June 2014 Retrieved February 8, 2015 from http://www.bls.gov/opub/mlr/2014/article/examining-the-completeness-of-occupational-injury-and-illness-data-an-update-on-current-research.htm; and Spieler EA, Wagner GR. Counting matters: implications of undercounting in the BLS survey of occupational injuries and illnesses. *American Journal of Industrial Medicine* 2014; 57:1077-1084. For estimates of the total number of work injuries occurring annually, see Leigh JP. Economic burden of occupational injury and illness in the United States. *Milbank Quarterly* 2011; 89:728-772, who estimates more than 8.5 million non-fatal work injuries occurred in 2007. See also Smith GS, Wellman HM, Sorock GS, et al. Injuries at work in the US adult population: Contributions to the total injury burden. *American Journal of Public Health* 2005; 95:1213–1219.

[5] Many illnesses that are caused by workplace exposure to toxic agents appear years after first exposure, and, since the treatment is unconnected to identifying the work-relatedness of the case, are never identified as occupational. The estimate of approximately 50,000 deaths annually was reached by scientists associated with the National Institute for Occupational Safety and Health and the American Cancer Society: Schulte PA. Characterizing the burden of occupational injury and disease. *Journal of Occupational and Environmental Medicine* 2005; 47:607-622 and Steenland K, Burnett C, Lalich N, Ward E, Hurrell J. Dying for work: The magnitude of U.S. mortality from selected causes of death associated with occupation. *American Journal of Industrial Medicine* 2003; 43:461-82. Further, only a very small proportion of these cases ever enter the workers' compensation system. See: Biddle J, Roberts K, Rosenman KD, Welch EM. What percentage of workers with work-related illnesses receive workers' compensation benefits? *Journal of Occupational and Environmental Medicine* 1998; 40:325-331.

[6] National Highway Traffic Safety Administration. 2013 Motor Vehicle Crashes: Overview. 2013 Motor Vehicle Crashes: Overview. Retrieved February 11, 2015 from http://www-nrd.nhtsa.dot.gov/Pubs/812101.pdf.

[7] National Safety Council. Injury Facts. 2014 edition. Itasca, IL. The Council's estimate is similar to that of Prof. Paul Leigh of the University of California Davis, who calculated the direct and indirect cost of work injuries in 2007 to be $192 billion. Leigh also estimated the cost of workplace illnesses in 2007 at $58 billion, resulting in a total cost for workplace injuries and illnesses of $250 billion (in 2007 dollars). See: Leigh JP. Economic burden of occupational injury and illness in the United States. *Milbank Quarterly* 2011; 89:728-772.

[8] For the costs of dementia, see Hurd MD, Martorell P, Delavande A, Mullen KJ, Langa KM. Monetary costs of dementia in the United States. *New England Journal of Medicine* 2013; 368:1326-1334. Diabetes costs are from Economic costs of diabetes in the U.S. in 2012. Diabetes Care 2013; 36:1033-1046.

[9] Seabury SA, Scherer E, O'Leary P, Ozonoff A, Boden L. Using linked federal and state data to study the adequacy of workers' compensation benefits. *American Journal of Industrial Medicine.* 2014; 57:1165-1173. See also Boden LI, Reville RT, Biddle J. "The adequacy of workers' compensation cash benefits." In Workplace Injuries and Diseases: Prevention and Compensation: Essays in Honor of Terry Thomason. Burton J, Roberts K, Bodah M. eds. Kalamazoo: W.E. Upjohn. 37-68, 2005.

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workers. *American Journal of Industrial Medicine* 2000; 38:498–506; Pransky G, Benjamin K, Hill-Fotouhi C, et al. Outcomes in work-related upper extremity and low back injuries: Results of a retrospective study. *American Journal of Industrial Medicine* 2000; 37: 400–409; Strunin L, Boden LI. Family consequences of chronic back pain. Social Science and Medicine 2004; 58:1385-1393; Mocan N, Tekin E. Obesity, self-esteem and wages. 2009 National Bureau of Economic Research NBER Working Paper No. 15101. Benabou, R, Tirole J. Self-confidence and personal motivation. The Quarterly Journal of Economics 2002; 117:871-915; and Bowles S, Gintis, H, Osborne M. The determinants of earnings: A behavioral approach. *Journal of Economic Literature* 2001; 1137-1176.

[11] Baron SL, Steege AL, Marsh SM, Menendez CC, Myers JR. Nonfatal work-related injuries and illnesses - United States, 2010. *Morbidity and Mortality Weekly Report* 2013;62(03):35-40; and Marsh SM, Menendez CC, Baron SL, Steege AL, Myers JR. Fatal work-related injuries - United States, 2005-2010. *Morbidity and Mortality Weekly Report* 2013;62(03):40-45; and Stanbury M, Rosenman KD. Occupational health disparities: A state public health-based approach. *American Journal of Industrial Medicine* 2014; 57:586-604. Estimates of the medical and productivity costs of work injuries and illnesses to low-wage workers are at Leigh JP. Numbers and costs of occupational injury and illness in low-wage occupations, Center for Poverty Research, and Center for Health Care Policy and Research, University of California Davis (December 2012), Retrieved February 11, 2015 from http://defendingscience.org/sites/default/files/Leigh_Low-wage_Workforce.pdf.

[12] "Working in jobs with overtime schedules was associated with a 61% higher injury hazard rate compared to jobs without overtime. Working at least 12 hours per day was associated with a 37% increased hazard rate and working at least 60 hours per week was associated with a 23% increased hazard rate." Dembe AE, Erickson JB, Delbos RG, Banks SM. The impact of overtime and long work hours on occupational injuries and illnesses: New evidence from the United States. *Journal of Occupational and Environmental Medicine* 2005; 62:588-97. See also Dembe AE, Delbos RG, Erickson JB. The effect of occupation and industry on the injury risks from demanding work schedules. *Journal of Occupational and Environmental Medicine* 2008;50:1185-94; Olds DM, Clarke SP. The effect of work hours on adverse events and errors in health care. Journal of Safety Research 2010; 41:153-162. Marucci-Wellman HR, Willetts JL, Lin T-C, Brennan MJ, Verma SK. Work in multiple jobs and the risk of injury in the US population. *American Journal of Public Health* 2014; 104:134-142. For increased risk of motor vehicle crashes, see Barger LK, Cade BE, Ayas NT, et al. Extended work shifts and the risk of motor vehicle crashes among interns. *New England Journal of Medicine* 2005; 352:125-134.

[13] Spieler, EA, Burton JF. The lack of correspondence between work-related disability and receipt of workers' compensation benefits. *American Journal of Industrial Medicine* 2012; 55:487-505; Boden LI, Spieler EA. Compensation for work injury and illness. In D. Béland, C. Howard, and K. J. Morgan, eds. Oxford Handbook of U.S. Social Policy. Chapter 25, 451-468. Oxford University Press. 2015. DOI:10.1093/oxfordhb/9780199838509.013.027. For an example, according to the Southern Poverty Law Center, the Alabama Legislature amended that state's Worker Compensation Act in 1992 to enact a more difficult standard for workers reporting "injuries which have resulted from gradual deterioration or cumulative physical stress disorders" because such claims were "one of the contributing causes of the current workers' compensation crisis facing [the] state." This definition includes the musculoskeletal disorders associated with repetitive work prevalent in the poultry industry. Source: The Southern Poverty Law Center and Alabama Appleseed, "Unsafe at These Speeds: Alabama's Poultry Industry and its Disposable Workers", 2013. Retrieved February 8, 2015 from http://www.splcenter.org/sites/default/files/Ala-poultry-report.pdf.

[14] Leigh JP, Marcin JP. Workers' compensation benefits and shifting costs for occupational injury and illness. *Journal of Occupational and Environmental Medicine* 2012;54:445-450.

[15] Shannon HS, Lowe GS. How many injured workers do not file claims for workers' compensation benefits? *American Journal of Industrial Medicine* 2002; 42:467-473; See also Biddle J, Roberts K, Rosenman KD, Welch EM. What percentage of workers with work-related illnesses receive workers' compensation benefits? Journal of Occupational and Environmental Medicine 1998; 40:325-331; and Azaroff LS, Levenstein C, Wegman DH. Occupational injury and illness surveillance: Conceptual filters explain underreporting. *American Journal of Public Health* 2002; 92:1421-1429. An excellent summary of the barriers to collecting the workers' compensation benefits to which they are entitled facing workers with workplace injuries and illnesses is provided by Spieler EA, Wagner GR. Counting matters: implications of undercounting in the BLS survey of occupational injuries and illnesses. *American Journal of Industrial Medicine* 2014; 57:1077-1084: "Underreporting in workers' compensation has been well-documented. The same forces that result in underreporting on OSHA 300 logs and in the SOII survey apply to workers' compensation: workers fear retaliation; health care providers fail to certify work-relatedness; employers discourage filing for benefits both directly and indirectly. Workers may also fail to file for benefits because they are unfamiliar with the system or, alternatively, believe that the system cannot be navigated easily; because they fear stigma and prejudice; or because they simply do not know that a condition is work-related or qualifies for benefits. In addition, many workers believe that the experience of filing a claim can be frustrating and demeaning, potentially involving insurance personnel and doctors who impugn their character and even investigators who spy on them and question their neighbors and friends. While workers' compensation also provides some incentives to workers to report injuries, by providing partial replacement of lost wages and first-dollar-coverage for medical care associated with a compensable injury, these incentives are often counterbalanced by these other factors."

[16] Davis LK, Grattan KM, Tak S, et al. Use of multiple data sources for surveillance of work-related amputations in Massachusetts, comparison with official estimates and implications for national surveillance. *American Journal of Industrial Medicine* 2014; 57:1120-32.

[17] Joe L, Roisman R, Beckman S, et al. Using multiple data sets for public health tracking of work-related injuries and illnesses in California. *American Journal of Industrial Medicine* 2014; 57:1110-19.

[18] Smith, R. Immigrant workers and workers' compensation: The need for reform. *American Journal of Industrial Medicine* 2012; 55:537-544; Culp K, Brooks M, Rupe K, Zwerling C. Traumatic injury rates in meatpacking plant workers. Journal of Agromedicine 2008; 13:7-16. Scherzer T, Rugulies R, Krause N. Work-related pain and injury and barriers to worker's compensation among Las Vegas hotel room cleaners. *American Journal of Public Health* 2005; 95:483–488; Premji S, Krause M. Disparities by ethnicity, language, and immigrant status in occupational health experiences among Las Vegas hotel room cleaners. *American Journal of Industrial Medicine* 2010; 53:960–975; Herbert R, Janeway K, Schechter C. Carpal tunnel syndrome and workers' compensation among an occupational clinic population in New York State. *American Journal of Industrial Medicine* 1999; 35: 335-342; Dong X, Ringen K, Men Y, Fujimoto A. Medical costs and sources of payment for work-related injuries among Hispanic construction workers. Journal of Occupational and Environmental Medicine 2007; 49:1367-1375. This is also seen in the results of numerous studies and surveys, including: Lashuay N, Harrison R. 2006. Barriers to occupational health services for low-wage workers in California: A report to the Commission on Health and Safety and Workers' Compensation, California, Department of Industrial Relations San Francisco. San Francisco, CA: University of California. Wilmsen C, et al. "Healthy Forests, Abused Workers". The Alliance of Forest Workers and Harvesters and The Labor Occupational Health Program, UC Berkeley, 2012. Retrieved February 8, 2015 from http://www.nwforestworkers.org/publications/surveyreportcolor.pdf; The Southern Poverty Law Center and Alabama Appleseed, "Unsafe at These Speeds: Alabama's Poultry Industry and its Disposable Workers", 2013. Retrieved February 8, 2015 from http://www.splcenter.org/sites/default/files/Ala-poultry-report.pdf; Villarejo D, McCurdy S, Bade B, et al. The health of California's immigrant hired workers. *American Journal of Industrial Medicine* 2010; 53:387-397. Also, Brandworks and the Urban Justice Center, "Feeding New York: Challenges and Opportunities for Workers in New York City's Food Manufacturing Industry", 2014. Retrieved February 8, 2015 from http://www.brandworkers.org/files/Feeding_New_York_0.pdf; Dietz M. Temporary Workers in California are twice as Likely as Non-Temps to Live in Poverty: Problems with Temporary and Subcontracted Work in California. UC Berkeley Labor Center, 2012. Retrieved February 8, 2015 from http://laborcenter.berkeley.edu/jobquality/temp_workers.pdf. And Workers Defense Project, "Construction Emergency: The Hidden Cost of Workplace Injuries", 2011. Retrieved February 8, 2015 from http://www.workersdefense.org/wp-content/uploads/2013/04/%E2%80%9CTexas_Construction_EmergencyV2%E2%80%9D.pdf.

[19] Leigh, JP, Robbins JA. Occupational disease and workers' compensation: coverage, costs, and consequences. *Milbank Quarterly* 2004; 2:689-721. See also Biddle J, Roberts K, Rosenman KD,Welch EM. What percentage of workers with work-related illnesses receive workers' compensation benefits? *Journal of Occupational and Environmental Medicine* 1998; 40:325-331.

[20] Spieler, EA, Burton JF. The lack of correspondence between work-related disability and receipt of workers' compensation benefits. *American Journal of Industrial Medicine* 2012; 55:487-505; Boden LI, Spieler EA. Compensation for work injury and illness. In D. Béland, C. Howard, and K. J. Morgan, eds. Oxford Handbook of U.S. Social Policy. Chapter 25, 451-468. Oxford University Press. 2015. DOI:10.1093/oxfordhb/9780199838509.013.027.

[21] Luo T, Mann A, Holden R. The expanding role of temporary help services from 1990 to 2008. *Monthly Labor Review*. August 2010:3-16; Dey M, Houseman SN, Polivka AE. Manufacturers' outsourcing to staffing services. *Industrial & Labor Relations Review* 2012; 65:533-559. For a discussion of the changing structure of work in the U.S., see Weil D. The Fissured Workplace: Why Work Became So Bad for So Many and What Can Be Done to Improve It. Harvard University Press. 2014.

[22] Locke M. Contract to cheat: How the reporting was done. Raleigh (NC) News and Observer. Retrieved February 8, 2015 from http://www.mcclatchydc.com/static/features/Contract-to-cheat/Investigation-built-on-payroll-records.html?brand=mcd.

[23] Misclassification hurts honest employers in another way. Some state systems (like that of Massachusetts) pay compensation to injured workers who were misclassified by their actual employer. These payments come from the workers' compensation system reserve funds collected from all employers who pay into the compensation system. This is yet another mechanism through which hazardous employers are subsidized, in this case by law-abiding ones.

[24] Smith CK, Silverstein BA, Bonauto DK, Adams D, Fan ZJ. Temporary workers in Washington State. *American Journal of Industrial Medicine* 2010;53:135-4.

[25] Recent studies on this topic include: Breslin FC, Smith P. Trial by fire: A multivariate examination of the relation between job tenure and work injuries. *Journal of Occupational & Environmental Medicine* 2006; 63:27-32; Morassaei S, Breslin FC, Shen M, Smith PM. Examining job tenure and lost-time claim rates in Ontario, Canada, over a 10-year period, 1999-2008. *Journal of Occupational & Environmental Medicine* 2013; 70:171-178; "Analysis of the Impact of Job Tenure on Workplace Injury Rates" (n.d.). Statistics -. Retrieved February 8, 2015 from http://www.hse.gov.uk/statistics/adhoc-analysis/workplace-injury-rates.htm. The increased risk of injuries among new workers has been known for many decades. For example, see Causes and Prevention of Accidents in the Iron

and Steel Industry, 1910-1919. *U.S Bureau of Labor Statistics*, 1922, Bulletin No. 298.

[26] See reports of temporary worker fatalities at: https://www.osha.gov/temp_workers/.

[27] ProPublica. Temp Land: Working in the New Economy. Retrieved February 8, 2015 from http://www.propublica.org/series/temp-land. See also Foley M, Ruser J, Shor G, Shuford H, Sygnatur E. Contingent workers: Workers' compensation data analysis strategies and limitations. *American Journal of Industrial Medicine*. 2014; 57:764-75.

[28] Shifting workers' compensation coverage to staffing agencies is not a zero-sum transition, in which the staffing agency must recoup these costs through higher prices paid by the host employer. In actuality, for workers doing the same high risk jobs, the workers' compensation insurance costs to the staffing agency are lower than those for the host employers. Staffing agencies, whose employees are often spread across many industries, generally pay lower premiums than the higher risk host employers. In addition, staffing agencies pay lower wages, and therefore the wage replacement costs for those injured temporary workers who do receive compensation payments are lower than payments for higher-paid host employer permanent employees. The workers' compensation costs to staffing agencies are further lessened by the reduced likelihood of injured temporary workers applying for workers' compensation: these workers are less likely to know their rights, and, even if they do, they may fear that they are less likely to get the next work assignment if they report any injury, particularly a compensable one.

[29] For breakdown of payment sources for medical costs, see Leigh JP, Marcin J. Workers' compensation benefits and shifting costs for occupational injury and illness. *Journal of Occupational and Environmental Medicine* 2012; 54:445-450. In addition, see Leigh, JP. Economic burden of occupational injury and illness in the United States. *Milbank Quarterly* 2011; 89:728-772; Groenewold MR, Baron SL. The proportion of work-related emergency department visits not expected to be paid by workers' compensation: Implications for occupational health surveillance, research, policy, and health equity. *Health Services Research* 2013; 48:1939-1959.

[30] Spieler, EA, Burton JF. The lack of correspondence between work-related disability and receipt of workers' compensation benefits. *American Journal of Industrial Medicine* 2012; 55:487-505; Boden LI, Spieler EA. Compensation for work injury and illness. In D. Béland, C. Howard, and K. J. Morgan, eds. Oxford Handbook of U.S. Social Policy. Chapter 25, 451-468. Oxford University Press. 2015. DOI:10.1093/oxfordhb/9780199838509.013.027; Boden LI, Ruser JW. Workers' compensation 'reforms,' choice of medical care provider, and reported workplace injuries, *The Review of Economics and Statistics* 2003; 85:923-929. See also Guo XS, Burton JF. The growth in applications for Social Security Disability Insurance: A Spillover effect from workers' compensation. Social Security Bulletin 2012; 72:69-88. This paper's conclusions are not consistent with those of another (McInerney M, Simon K. The effect of state workers' compensation program changes on the use of federal Social Security Disability Insurance. *Industrial Relations* 2012; 51:57-88) whose authors find no correlation between changes in state workers' compensation benefits and the growth of SSDI programs. Since these papers are correlational, they carry far less weight in identifying causal relationships than the other papers cited here on the relationship of work injury, workers' compensation benefits and SSDI.

[31] Reville RT, Schoeni, RF. The fraction of disability caused at work. *Social Security Bulletin* 2004; 65:31-37. Of those reporting disability, 17% report the impairment was caused by a work injury, 15% said their impairment was due to the nature of their work, and an additional 4% were impaired because of work hazards. Among all study participants who reported being disabled and that their health condition was caused by work, only 12% had ever received workers' compensation benefits, while 29% were currently enrolled in SSDI.

[32] O'Leary P, Boden LI, Seabury SA, Ozonoff A, Scherer E. Workplace injuries and the take-up of Social Security Disability benefits. *Social Security Bulletin* 2012; 72:1-17.

[33] National Safety Council. Injury Facts. 2014 edition. Itasca, IL.

[34] National Safety Council. Accident Facts. 1994 edition. Chicago, IL.

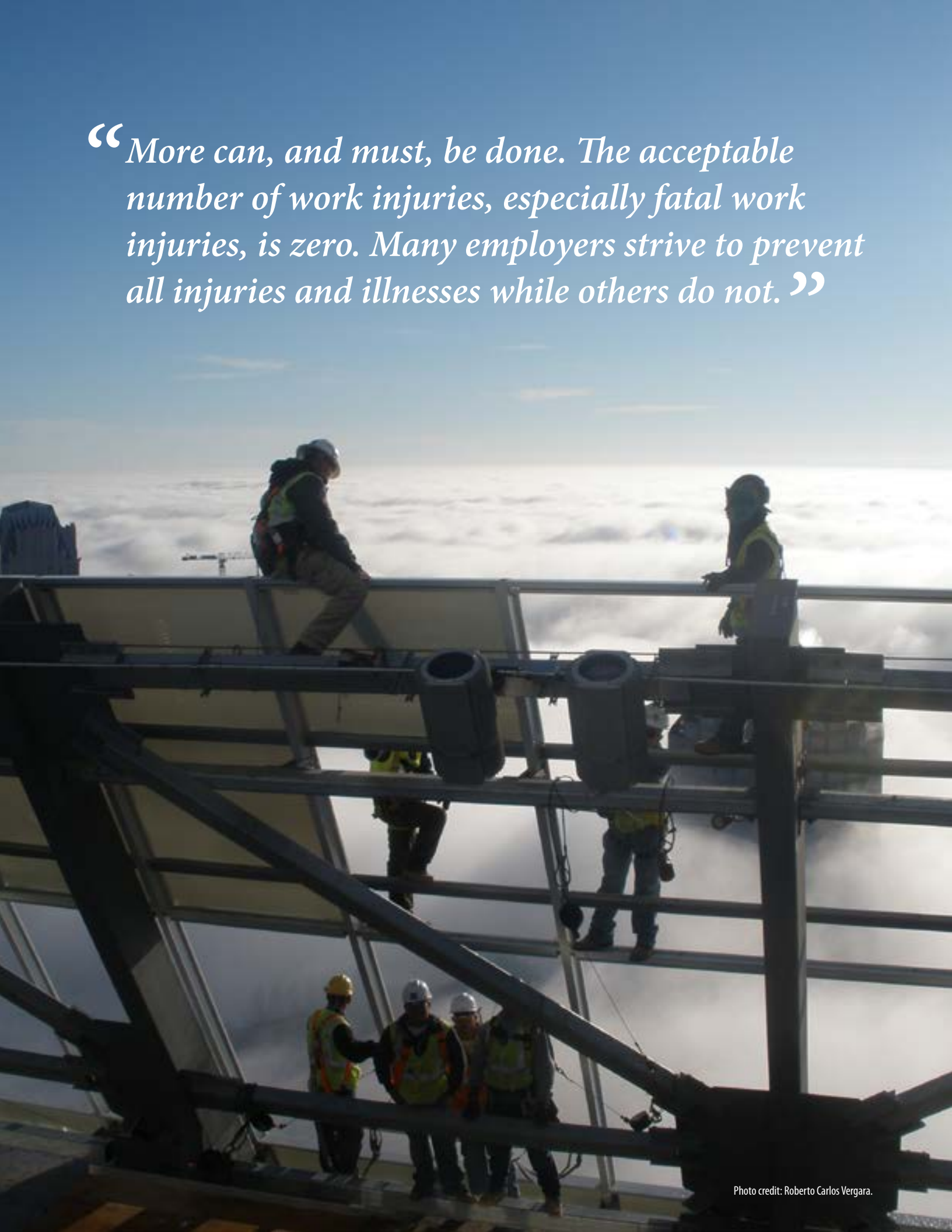
[35] Bureau of Labor Statistics. Revisions to the 2012 Census of Fatal Occupational Injuries (CFOI) counts April 2014. Retrieved February 8, 2015 from http://www.bls.gov/iif/oshwc/cfoi/cfoi_revised12.pdf.

[36] Quartile Data: Table Q2. Survey of Occupational Injuries and Illnesses. Bureau of Labor Statistics, Department of Labor, 2012. Retrieved February 11, 2015 from http://www.bls.gov/iif/oshwc/osh/os/ostb3586.pdf.

[37] Mendeloff J, Staetsky L. Occupational fatality risks in the United States and the United Kingdom. *American Journal of Industrial Medicine*. 2014; 57:4-14.

[37] Improvements in benefits provided by the workers' compensation system to injured workers would also, to a limited degree, reduce the economic impact of workplace injuries and illnesses on working families and would decrease income inequality, particularly among low-wage workers. While the Department of Labor has had an interest in improving the state-based workers' compensation programs for many decades (see, for example, 1972 Report of the National Commission on State Workmen's Compensation Laws, available at: http://workerscompresources.com/?page_id=28), there is little federal input in or oversight of those systems. Further, under the Occupational Safety and Health Act of 1970 (OSHA's authorizing legislation) the agency has no role in state workers' compensation programs. This paper focuses primarily on prevention injuries and illnesses (rather than improving the compensation of those already injured), clearly the better approach to eliminating the income disparities caused by work injuries.

"More can, and must, be done. The acceptable number of work injuries, especially fatal work injuries, is zero. Many employers strive to prevent all injuries and illnesses while others do not."



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