Understanding changes over time in awards for workers' compensation benefits: evidence from Oregon

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Abstract

Prior work (Fulmer 2026) documented a substantial long-term decrease in the receipt of workers' compensation benefits, largely attributable to improvements in workplace safety. However, by observing only benefit awards, that paper could not explore the roles of worker applications versus stricter insurer award decisions in driving this trend. This paper exploited aggregate administrative data from Oregon from 2003 through 2018 to achieve this more complete understanding. I found that a 35.7 percent decrease in the rate of recordable occupational injuries and illnesses explained nearly all (95.0 percent) of the 37.6 percent decrease in the rate of applications and fully explained the 35.5 percent decrease in the rate of awards. (JEL No. I18, J28, J32)

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1 Introduction

Oregon established its workers' compensation (WC) program in 1913. Initially, participation in the program for employers was voluntary. Employers who contributed to the Oregon Industrial Accident Fund were immune from lawsuits brought by workers who suffered occupational injuries and illnesses (OIIs). On the other hand, employers gave up their legal defenses to negligence if they did not contribute. In 1968, this voluntary system ended, and almost all employers in Oregon were required to maintain WC coverage. The upshot for workers was that while they lost their ability to sue, they were provided with medical and cash benefits in the event of an OII, regardless of fault.

In Oregon, WC serves as a fundamental protection for workers because it ensures they receive timely payments for medical bills and lost wages resulting from OIIs. It also provides a measure of predictability to employers in the costs of remunerating injured workers. However, the competing priorities of each of these constituencies, along with general trends in workplace safety, have led to significant changes in the rate of WC benefits awarded over time.

In this paper, I turned to data from the Oregon Department of Consumer and Business Services to answer the question: What explained the change over time in awards for workers' compensation in Oregon? This built on companion work in Fulmer (2026b) by including information about applications for WC benefits. In that paper, I lacked direct information on the number of applications because I only had indirect information via the number of awards. Since the data from Oregon includes information not only on awards, but also on denials, I was able to exploit this more complete picture on the WC application and awarding process as a key contribution of the current paper. I found that the 35.7 percent decrease in the rate of recordable OIIs explained 95.0 percent of the 37.6 percent decrease in the rate of applications and all of the 35.5 percent decrease in the rate of awards over my study period of 2003 through 2018. Moreover, I found that the denial rate decreased from 16.0 percent to 13.2 percent of applications, which provided evidence against the explanation that restricted access to the program drove the observed trends.

The WC program in Oregon has been studied extensively in various literatures. Recent work has included an examination of the relationship between hour-of-work and accepted disabling claims

Figure 1: Notice of Compliance Poster, Oregon

(Yang et al. 2020), interactions with recreational marijuana legalization (Dong 2022), identification of hazardous industries for young workers (Yang et al. 2021), and estimation of the differences in responsiveness to WC benefit changes between skilled and unskilled workers (Mullen and Rennane 2024). In other companion work (Fulmer 2026a), I study spillover effects of a change in Oregon's benefit calculation law on applications to Social Security Disability Insurance. These studies demonstrate the value that WC data from Oregon can bring in asking and answering important questions.

This paper proceeds as follows. Section 2 provides the institutional details of the WC program in Oregon. Section 3 discusses the datasets I use in the paper. Section 4 analyzes the changes over time in Oregon and their explanations. Section 5 concludes.

2 Background

Oregon requires almost all employers to provide WC coverage for their workers who are classified as employees. Workplaces must display in a "central gathering area" the poster shown in Figure 1. This poster makes clear to workers who experience an OII of their right to apply for WC benefits. Workers with an OII are expected to fill out Form 801, "Report of Job Injury or Illness." This is the same form that workers would use to submit an application for WC benefits except that workers who do not want to apply for WC benefits do not sign the form.

Covered workers who suffer an OII may incur medical bills, lost wages, or both. Benefits that pay only for medical bills are called *nondisabling* (also called medical-only) benefits. Benefits that pay for medical bills and provide cash payments to make up for a portion of lost wages are called *disabling* (also called indemnity) benefits. There are four types of disabling benefits: temporary total, temporary partial, permanent total, and permanent partial.

Total disability is paid to workers who cannot return to work after a three day waiting period. Payments can be made to workers retroactively for the lost time during the waiting period if the duration of disability is at least 14 days or the worker is admitted as an inpatient to a hospital within 14 days. Temporary total disability pays 66 2/3 percent of a worker's wage up to 133 percent of the statewide average weekly wage in Oregon. A worker who can return to work, but at a lower wage, receives a proportional amount of temporary partial disability benefits.

Once a worker becomes medically stationary (also referred to as reaching maximum medical improvement), the WC insurer determines the amount of permanent benefits. Permanent total benefits are paid for when a worker is 100 percent disabled. The calculation is the same as for temporary total benefits except these benefits continue for the rest of the worker's life and provide for additional survivors' benefits to spouses and children. Permanent partial benefits are paid for when a worker is less than 100 percent disabled. The impairment is rated as a percent of the whole person and benefits are calculated as this percent multiplied by 100 times the statewide average weekly wage. Workers receiving permanent partial benefits who cannot return to work also receive a work disability payment. The sum of the impairment payment and any work disability payment

is paid out over time unless it is requested and approved to be paid as a lump sum or is not more than $6,000 in which case it must be paid as a lump sum.

3 Data

3.1 Oregon's Department of Consumer and Business Services

Oregon has been particularly interested in how the WC insurance premiums employers pay in the state compare with that of other states and has published a biennial comparative study since 1986. As an outgrowth of that and other reports, the state posts a multitude of data on various aspects of its WC program. In Oregon, the WC program is overseen by the Workers' Compensation Division of the Department of Consumer and Business Services. Most of the data the division posts is in aggregated form. To my knowledge, these posts contain the most comprehensive publicly available data of all WC programs in the country.

3.2 National Council on Compensation Insurance

The National Council on Compensation Insurance (NCCI) is a nonprofit organization that standardizes the calculation of WC insurance rates across 35 states and the District of Columbia (each of these jurisdictions is colloquially referred to as an "NCCI state"). Oregon is an NCCI state. In addition to these NCCI states, two states, Indiana and North Carolina, report data to the NCCI, bringing to 38 the number of states (and D.C.) that report data to NCCI. One key output of NCCI consists of state-specific insurance rate recommendations for approximately 550 classification codes to which employers are assigned based on their business operations. These insurance rates then become the basis of the premiums that employers pay to obtain WC insurance coverage for their employees. To accurately produce its recommendations, NCCI receives data from insurers. Insurers providing WC coverage in NCCI states are required by their state to report this data to NCCI. The data insurers report includes, among other items, data on the medical and

indemnity benefits that workers receive. NCCI publishes these data in aggregated form.

3.3 National Academy of Social Insurance

The National Academy of Social Insurance is a nonprofit organization focused on the research of social insurance programs, including Medicare, Medicaid, Unemployment Insurance, the Supplemental Nutrition Assistance Program, the Earned Income Tax Credit, and WC. The Academy has published for over 20 years an annual report on the benefits provided by, coverage under, and costs of the WC programs throughout the country. The report includes these comprehensive estimates for WC programs in all 50 states and the District of Columbia. While the data is aggregated at the state level and does not allow for granular analysis of claim characteristics, it provides the necessary scope to calculate the amount of benefits normalized to $100 of covered wages across Census regions.

3.4 Survey of Occupational Injuries and Illnesses

The Survey of Occupational Injuries and Illnesses (SOII) is either administered by state-level agencies on behalf of the BLS or BLS staff in non-participating states. The impetus behind the survey was the signing of the Occupational Safety and Health Act of 1970. Among other provisions, the Act mandated the collection of data on occupational injuries and illnesses. The SOII program follows record-keeping guidelines set forth by the Occupational Health and Safety Administration.

The SOII surveys approximately 230,000 establishments and provides them with advance notification of their obligation to provide data on occupational injuries and illnesses for a specified survey year. Importantly, the Occupational Health and Safety Administration requires private firms to fill out the SOII if they receive such a notice from the BLS. This applies *even if the firm is otherwise exempt* from keeping injury and illness records. Establishments report basic information on themselves (*e.g.,* employee hours worked), summary information on injuries and illnesses, and more detailed information on cases that led to at least one day away from work. Each year, the data collection process is completed by the middle of summer.

There are limitations to using the SOII data. For instance, BLS does not publish estimates for each state each year. This is because states need to participate in survey administration for state-level estimates to be released. Additionally, the BLS is aware of issues relating to undercounts of injuries and illnesses. These limitations, which are addressed in detail by the National Academies of Sciences, Engineering, and Medicine (2018), make the SOII a potentially problematic dataset with which to work. Despite this, there is no other source of injury and illness data with the scope and history of the SOII. This makes the SOII the best source of injury and illness data for this paper.

4 What explained the change over time in awards for workers' compensation in Oregon?

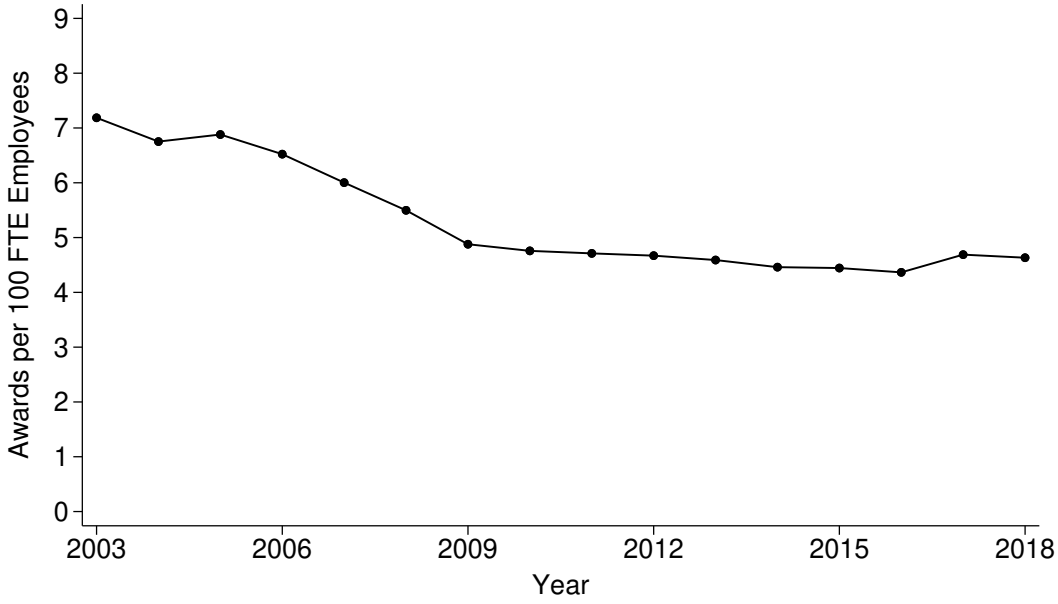
In practice, there is no bright line distinction between the OIIs that lead to either disabling or nondisabling awards. Hence, for the purposes of my analysis, I combined both of these types of WC awards. Moreover, to maintain consistency between the data from Oregon and the SOII, I calculated rates of OIIs, applications, and awards in terms of 100 full-time equivalent (FTE) employees:

$$Outcome\ per\ 100\ FTE = 100 \times \frac{Outcome}{H_{SOII}} \times 2{,}000 \tag{1}$$

In equation 1, *Outcome* refers to OIIs, applications, or awards. I obtained H_{SOII} by back-calculating the number of hours worked from the estimates of incidence rates in the SOII. Following BLS convention, I considered one year of work to be 50 weeks at 40 hours per week, so 1 FTE employee works 2,000 hours per year. Thus, $FTE = H_{SOII}/2{,}000$.

Figure 2 shows the trend in the rate of awards in Oregon from 2003 through 2018. In Oregon, the rate of awards decreased from 7.19 per 100 FTE employees to 4.63 per 100 FTE employees, or 35.5 percent. To see whether Oregon served as an informative case study in exploring why awards decreased nationally over the period, I compared the awards under the WC program in Oregon to both the 38 jurisdictions that report data to the National Council on Compensation Insurance and

Figure 2: Trend in the Rate of Awards of Workers' Compensation Benefits, Oregon, 2003-2018

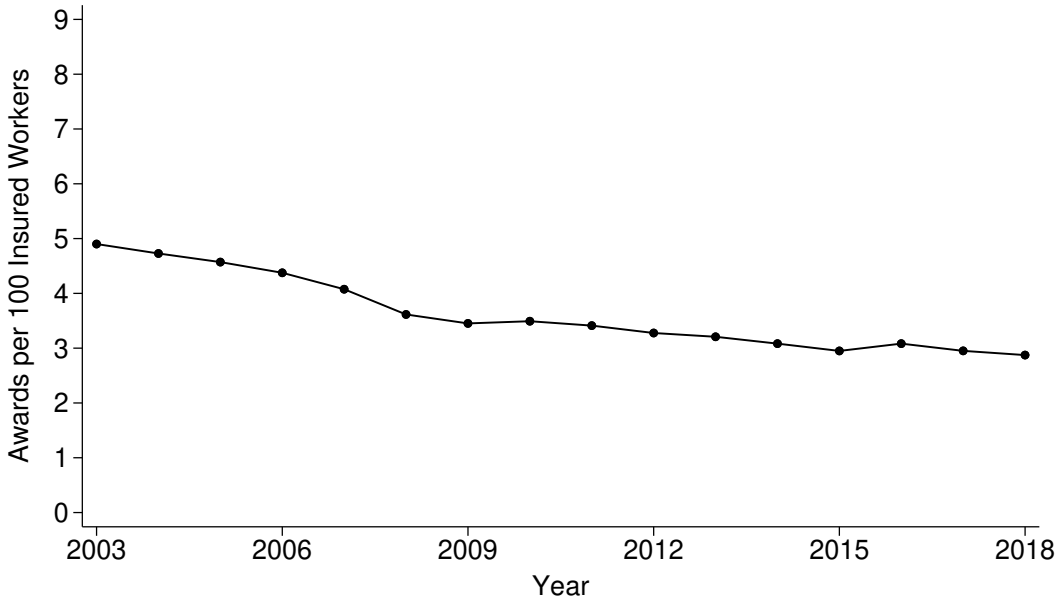


all 51 national jurisdictions covered by the National Academy of Social Insurance.

Figure 3 shows the trend in the rate of awards based on the data from the National Council on Compensation Insurance. The denominator in this rate was the number of insured workers, rather than FTE employees, because the data did not include information on hours worked. However, I considered this a valid comparison because the correlation between employee status and insured worker was extremely high (over 0.99 over the study period). The rates were then scaled up in terms of 100 insured workers for ease of exposition. Based on the 38 states (including Oregon) where the National Council on Compensation Insurance collects insurer data, the 41.4 percent decrease calculated using these data was similar to that of Oregon's 35.5 percent decrease.

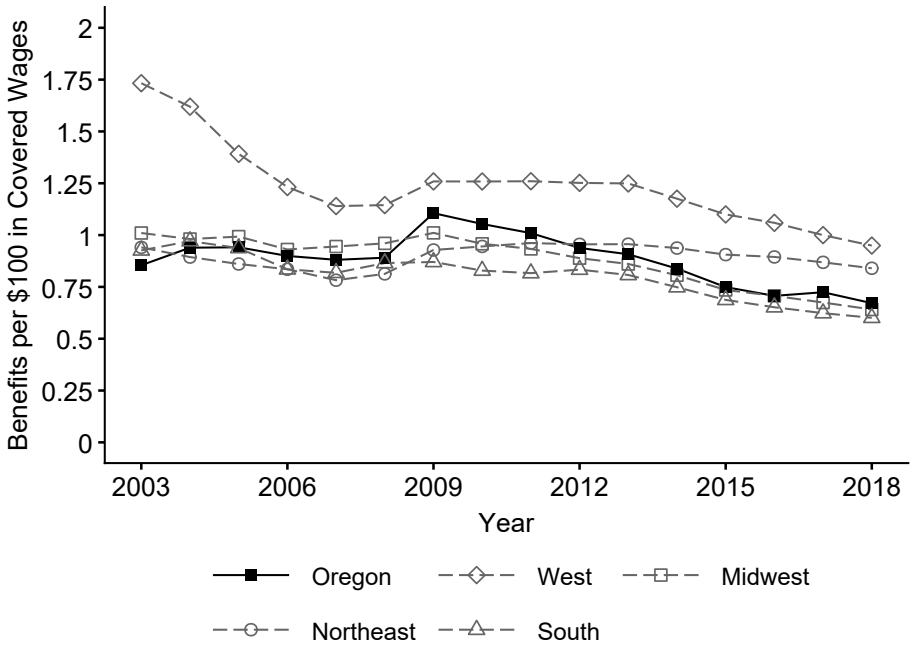
Figure 4 shows the trend in the amount of total benefits (indemnity plus medical) provided by WC programs based on the data from the National Academy of Social Insurance on all 51 jurisdictions (50 states plus Washington, D.C.). I grouped states by the four Census regions: Northeast, South, Midwest and West. Since Oregon is in the West Census region, I calculated the rates for that region with Oregon removed. The denominator in these rates was the amount of wages earned by covered workers. The rates were then scaled up in terms of $100 of covered wages for

Figure 3: Trend in the Rate of Awards, NCCI States, 2003-2018



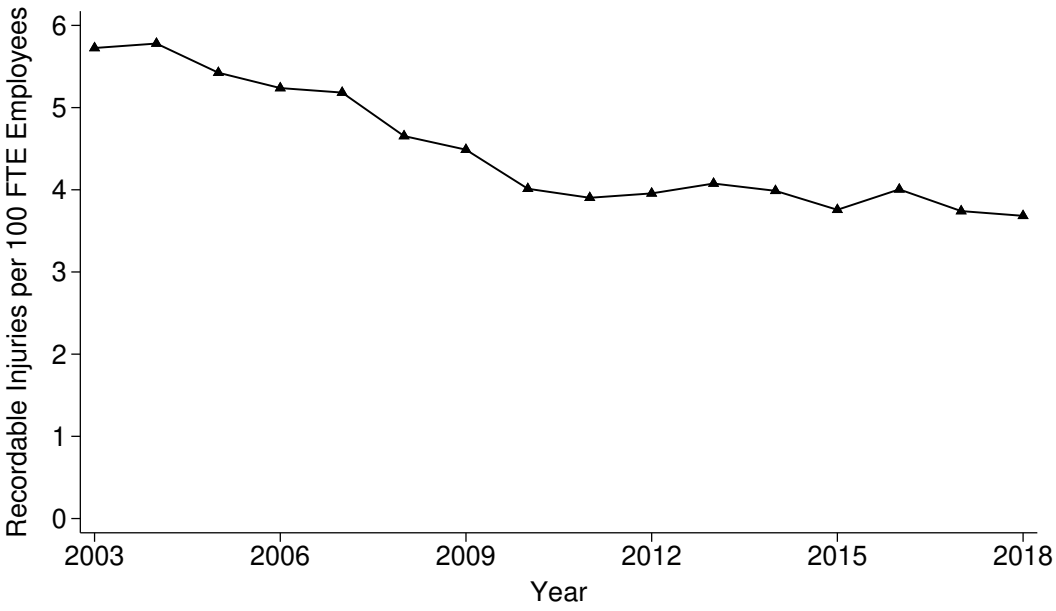
Data from the National Council on Compensation Insurance.

Figure 4: Comparison of Workers' Compensation Benefits, Oregon vs. Census Regions, 2003-2018



Data from the National Academy of Social Insurance. Oregon was excluded from the West Census region.

Figure 5: Trend in the Rate of Recordable Injuries, Oregon, 2003-2018

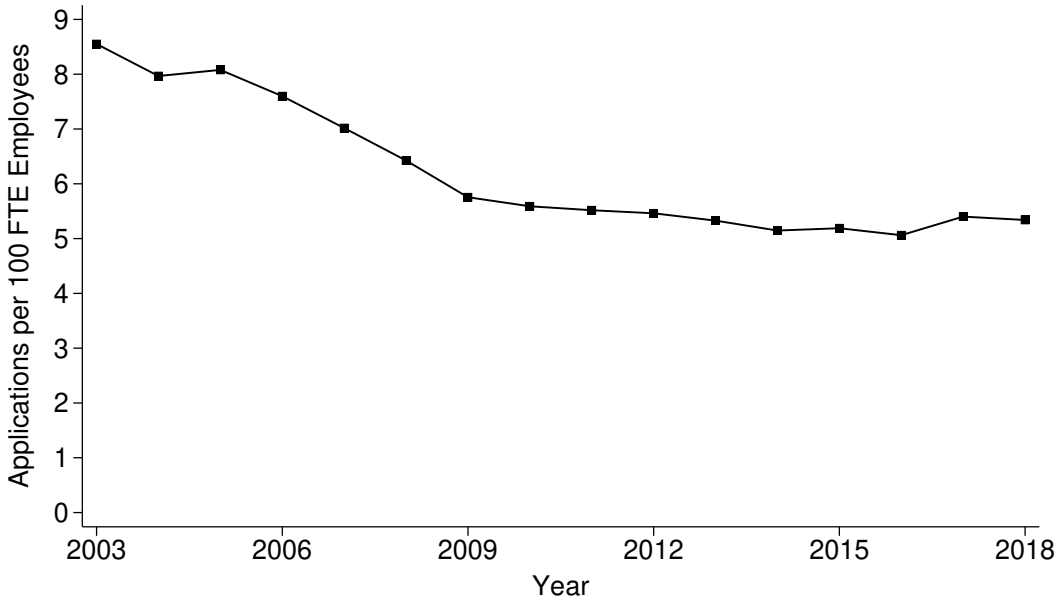


ease of exposition. Based on inspection of the figure, it was apparent that Oregon followed closely both the trends and levels of benefits in the Midwest, Northeast, and South Census regions. And while Oregon was somewhat lower in level than the West Census region, Oregon mostly followed its trend.

Having established the representativeness of Oregon's WC program, I continued with my analysis. I next examined the trend in the rate of recordable OIIs because OIIs are the impetus for all WC awards. For an OII to be *recordable*, it generally must result in at least one of the following: loss of consciousness, days away from work, restricted activity or job transfer, or medical treatment beyond first aid. Figure 5 shows the trend in the rate of recordable OIIs in Oregon over the period. The rate of recordable OIIs decreased from 5.73 per 100 FTE employees to 3.68 per 100 FTE employees, or 35.7 percent. This indicated that the decrease in the rate of recordable OIIs explained all of the decrease in the rate of WC awards.

However, the analysis above missed any discussion of the link between OIIs and awards—applications. Indeed, once OIIs have occurred, workers must decide whether or not to apply for WC benefits. I defined the number of applications as the sum of accepted disabling claims, estimated

Figure 6: Trend in the Rate of Applications for Workers' Compensation Benefits, Oregon, 2003-2018

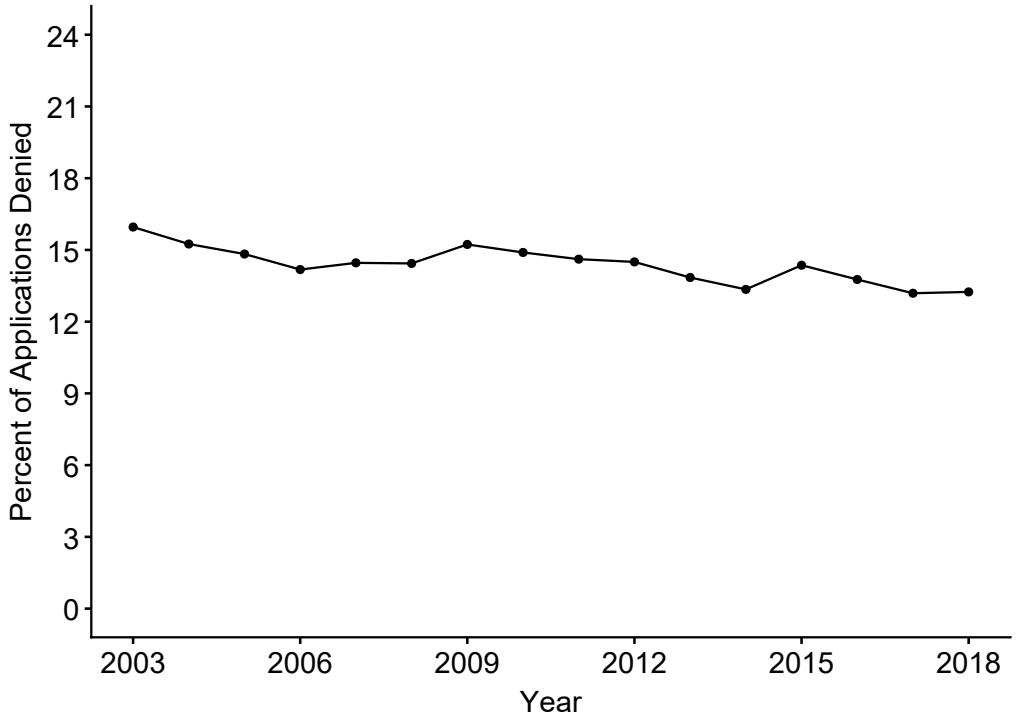


accepted nondisabling claims, and total denied claims. It is important to note the limitations in this construction. First, the count of accepted nondisabling claims is an estimate provided by the Oregon Department of Consumer and Business Services, rather than a precise tabulation. Second, the administrative data reports all denials (including those subsequently overturned on appeal) and all accepted awards (including those granted after appeal). This probably created a slight double-counting of applications that were initially denied but later awarded. Consequently, my estimate of applications likely represented an upper bound.

Figure 6 shows the trend in the rate of applications for WC benefits in Oregon. The rate of applications decreased from 8.55 per 100 FTE employees to 5.34 per 100 FTE employees, a decrease of 37.6 percent. This result suggested that the decrease in the rate of recordable OIIs explained 95.0 percent ($= -35.7/-37.6 \times 100\%$) of the decrease in the rate of applications.

A potential alternative explanation for the decrease in awards was that insurers became increasingly strict in their approval of claims over the period. If this were true, then the rate of denials should have increased. Figure 3.7 shows the trend in the denial rate. The rate was defined as the

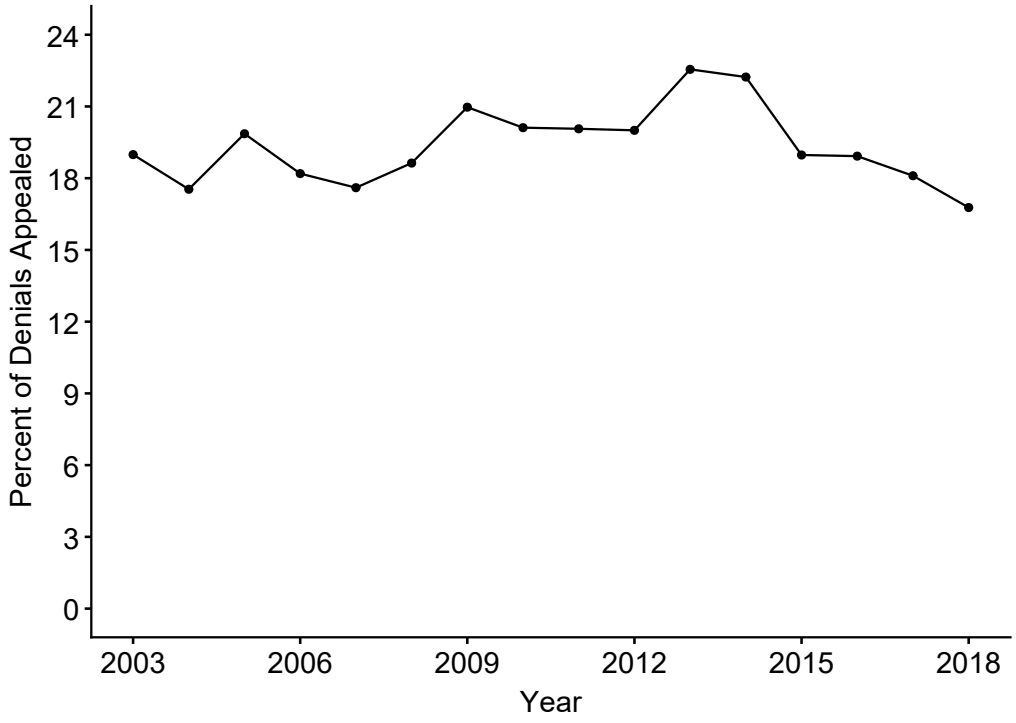
Figure 7: Trend in the Rate of Workers' Compensation Denials, Oregon, 2003-2018



percentage of total applications that were denied by insurers. Rather than increase over the period, the denial rate decreased from 16.0 percent of applications in 2003 to 13.2 percent of applications in 2018, a (relative) decrease of 17.0 percent. This indicates that insurers approved a higher proportion of applications at the end of the period than at the beginning. This refutes the explanation of insurers becoming increasingly strict over the period.

To further investigate the adjudication process, Figure 3.8 shows the trend in the appeal rate. The rate was defined as hearing orders involving a claim denial expressed as a percentage of all denied claims. A hearing is part of the appeals process in which complaints are heard in front of an administrative law judge. These were the best available data on the appeals process, but there were two caveats: (1) a hearing is the second part of the appeals process after a request of reconsideration at the Workers' Compensation Division and (2) orders may deal with multiple cases if those cases were part of a group. Hence, this served as a proxy for the rate at which workers contest insurer denials. If workers perceived denials as increasingly strict, then the rate of appeals should have

Figure 8: Trend in the Rate of Workers' Compensation Appeals, Oregon, 2003-2018



increased. Rather than increase over the period, the appeal rate decreased from 19.0 percent in 2003 to 16.8 percent in 2018, a (relative) decrease of 11.7 percent. This provides further evidence against insurers becoming increasingly strict over the period.

Taken together, the analyses of these two figures provided substantial evidence against insurers becoming increasingly strict over the period. That is, the decrease in WC awards in Oregon was not associated with insurers denying more claims or workers contesting fewer denials. Instead, the analysis indicated that the decrease in awards was strongly associated with the decrease in the rate of recordable OIIs. The 35.7 percent decrease in the rate of recordable OIIs explained 95.0 percent of the 37.6 percent decrease in the rate of applications. Since the denial rate decreased, this reduction in applications flowed directly through to the 35.5 percent decrease in the rate of awards.

Why have applications fallen faster than OIIs? While the decrease in the rate of recordable OIIs explained the vast majority of the decrease in applications, the remaining gap may have been attributable to the expansion of two alternative social safety net programs in Oregon: paid sick

leave and Medicaid.

First, Oregon implemented a statewide mandatory paid sick leave program effective January 1, 2016. This policy allows workers to accrue protected sick time, which can be used for injury recovery. For workers with minor injuries, paid sick leave offers a more attractive alternative to WC for two reasons: it provides 100 percent wage replacement immediately, whereas WC temporary total disability benefits typically replace only two-thirds of wages and require a three-day waiting period. Moreover, it avoids the administrative burden and potential employer friction associated with filing a formal WC application. Recent evidence from Dong et al. (2024) supports this substitution hypothesis. Dong et al. found that the implementation of paid sick leave mandates led to a 13.5 percent decrease in the receipt of WC benefits. Given that Oregon implemented this mandate near the end of the study period, this likely contributed to the decrease of applications.

Second, the expansion of Medicaid coverage under the Affordable Care Act, which Oregon implemented in 2014, likely reduced the necessity of filing WC applications. Prior to Medicaid expansion, WC was often the only insurance available that covered medical treatment for OIIs. With the expansion of Medicaid, workers gained access to health coverage that operates alongside WC. This potentially allows workers to seek treatment for minor OIIs through Medicaid, bypassing WC entirely. This mechanism is consistent with the findings of Groenewold and Baron (2013), who observed that a significant portion of work-related emergency department visits were billed to private insurance or government programs (such as Medicaid) rather than WC.

5 Conclusion

This paper contributes to the literature a more complete understanding of the forces behind the changes in the rate of WC awards over time. I built on Fulmer (2026b) by incorporating data from Oregon that allowed for studying applications. The analysis yielded two primary findings. First, the decrease in awards was strongly associated with a decrease in the rate of OIIs, not by the increasingly strict insurer decisions. In other words, I found no evidence that insurers have become

more aggressive in denying claims. On the contrary, denial rates along with appeal rates decreased over the period. Second, the 35.7 percent decrease in the rate of recordable OIIs explained 95.0 percent of the 37.6 percent decrease in the rate of applications and all of the 35.5 percent decrease in the rate of awards. These results suggest that the decrease in the rate of WC awards in Oregon was associated with improved workplace safety, rather than a restriction of access for injured workers.

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