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Do Zero-Cost Workers' Compensation Medical Claims Really Have Zero Costs?:

The Impact of Workplace Injury on Group Health Insurance Utilization and Costs

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Abstract

Objective—Previous research suggests that non–workers' compensation (WC) insurance systems, such as group health insurance (GHI), Medicare, or Medicaid, at least partially cover work-related injury and illness costs. This study further examined GHI utilization and costs.

Methods—Using two-part model, we compared those outcomes immediately after injuries for which accepted WC medical claims made zero or positive medical payments.

Results—Controlling for pre-injury GHI utilization and costs and other covariates, our results indicated that post-injury GHI utilization and costs increased regardless of whether a WC medical claim was zero or positive. The increases were highest for zero-cost WC medical claims.

Conclusion—Our national estimates showed that zero-cost WC medical claims alone could cost the GHI $212 million per year.

Occupational injuries impose high costs on the US health care system. Leigh and Marcin[1] recently estimated that the total national medical cost of occupational injuries and diseases in the Unites States was $29.8 billion in 2007 alone. Workers' compensation (WC) programs were established as a social insurance against medical expenses and lost wages that result from occupational injuries and illnesses. These no-fault programs were enacted as a compromise in exchange for limits to workers' rights to sue employers under tort law. Each US state has enacted its own laws on WC to determine eligibility and compensation. Under those laws, injuries and illnesses must be work-related and indemnity payments are subject to a waiting period (usually 3 to 7 days).[2]

Filing for WC is a lengthy, complicated process, and research suggests that workers under-file for WC benefits.[3] Workers with known or suspected occupational injuries and illnesses might not file for WC benefits because of fear of disciplinary action, stigmatization, harassment, or denial of other benefits.[4–9] A Canadian study[10] surveyed nationally

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representative households and found that 40% of workers with an eligible injury for WC did not file a claim (95% confidence interval [CI]: 32% to 48%). Biddle et al[6] also reported low rates of WC filing in firms with 500 or more employees in the state of Michigan. Both work-related and suspected work-related cases were included, with a determination made by the diagnosing clinician and reported to the Michigan Department of Consumer and Industry Affairs. Fifty-five percent of workers who had been diagnosed with work-related disease by a health care professional did not file for lost-wage benefits. A similar survey conducted by Rosenman et al[9] showed that, among 1598 Michigan workers with confirmed or suspected occupational musculoskeletal disease, only 25% filed for WC.

Various factors affecting the probability of a worker to file and to receive WC benefits have been cited in the literature.[3–5] There is minimal research, however, on how WC medical claims with no WC payments (ie, zero-cost WC medical claims) affect injured workers, group health insurance (GHI) utilization, or society at large. Groenewold and Baron[11] analyzed demographic differences in WC coverage on the basis of the proportion of work-related hospital emergency department (ED) visits not paid by WC system. Between 2003 and 2006, the odds of a given work-related ED visit not to be covered by the WC system increased by 20%, and the ED costs of black or female workers were less likely to be covered by WC than those of white or male workers. Costs were examined in two studies. Leigh and Marcin[1] estimated the costs of work-related injuries and illnesses that were covered and not covered by the WC system on a national level, using data from the Bureau of Labor Statistics[12] and the National Council on Compensation Insurance. Workers' compensation payments in 2007 were estimated to be $51.7 billion, with $29.8 billion applied to medical costs. Medical costs not covered by WC were estimated at $14.22 billion covered by other insurance, $7.16 billion covered by Medicare, and $5.47 billion covered by Medicaid. In a study using a database of 16 large employers, Bhattacharya and Park[13] reported that workers with a history of prior WC claims were more likely to file group health medical claims and had higher average monthly medical costs over a 3-year period. In summary, it seems that non-WC insurance systems at least partially cover work-related injury and illness costs.

This study further examined GHI (outpatient, prescription drug, and inpatient) utilization and costs by comparing those outcomes immediately after injuries for which WC claims resulted in either zero or positive costs to the WC system. We used the same large-employer database as Bhattacharya and Park.[13] Nevertheless, our study differs from their study in at least two ways. First, their major objective was to examine excess GHI costs between workers with prior WC claims and workers without prior WC claims. We compared GHI utilization of WC claimants whose WC claims were accepted and paid against claims that were accepted but not paid. We refer to claims that were accepted but not paid as zero-cost claims. Workers' compensation medical claims could be zero if claimants do not require medical intervention or a visit to a doctor at all when the claim was filed. Second, their study did not have any specific time frame between the incidence of injury and utilization of GHI. In this study, we compared the GHI utilization of WC claimants within a specific period of time after injury. This enabled us to control for GHI utilization before injury.

DATA

The 2002–2005 Thomson Reuters MarketScan workers' compensation, enrollment, and commercial claims and encounters data sets were used. The MarketScan databases are administrative data sets provided by 16 large employers in the United States for a combined total of more than 440,000 employees. The databases cover 48 states and have been used extensively by researchers in different disciplines. We used the MarketScan national weights provided by MarketScan to adjust the data toward estimated regions and demographic characteristics of employees with employer-sponsored private health insurance in the country. The weights were computed on the basis of the household component of the Medical Expenditure Panel Survey conducted by the Agency for Healthcare Research and Quality.

These data sets contain information on both occupational injuries (identification number [ID], date of injury, date of WC file opened, WC file status, amount of indemnity and medical payments, return-to-work status, etc) and GHI records (ID, service date, total payments, *International Classification of Diseases*, *Ninth Revision*, codes, etc). We linked the three data sets by using the anonymous and a unique "ID" variable. Linking these data sets provided the necessary information to compare GHI utilization of WC claimants by their WC claim status. It also enabled us to observe GHI utilization of these workers before and after the incidence of the occupational injury.

We considered a cohort of more than 12,000 injured workers who filed for WC insurance between January 1, 2002, and December 31, 2005, and enrolled in GHI for the whole 4 years. We observed the GHI outpatient, drug use, and inpatient utilization and costs of this cohort of claimants before and after their injury. Injured workers with open claims and claimants who were insured by family member plans were not considered. We also excluded two outlier cases with post-injury outpatient and inpatient costs of more than a million dollars.

We considered two dependent variables—GHI utilization and costs. *Utilization* was defined as at least one outpatient or inpatient visit paid by GHI, and *cost* was defined as the total amount of money paid by GHI. All costs were converted to 2012 price level by using the medical care consumer price index (https://research.stlouisfed.org). Our main explanatory variable was the status of a WC medical claim—zero-cost or positive-cost. A WC medical claim was considered a zero-cost claim if no medical costs were paid from the WC program, but the reasons for zero costs to WC were not available in these data. We included sex, age, union status, hourly versus salaried compensation, health insurance type, industry, and region as covariates. Because all variables except for sex could change between 2002 and 2005, the values of the variables at the time of injury were used.

METHODS

To fully capture the GHI utilization of injured workers, we had to determine how long to observe claimants' GHI utilization after the occurrence of injury. In this study, the data structure allowed us to observe the time path of GHI costs before and after the incidence of

injury. As shown in Figure 1, using the whole sample (both with zero and positive WC cost claims), we computed the average GHI outpatient and inpatient costs 1, 2, 3, and 4 months before and after the incidence of injury. Then, we examined whether there were any statistically significant GHI cost differences in each successive pre-/post-injury months to determine the follow-up period. In other words, we observed the outpatient and inpatient GHI utilization of injured workers up to the point where the post-injury costs returned to the pre-injury level. Drug claims were directly related to outpatient cases. Therefore, we did not compute separate time frames for drug costs. Because injuries occurred on various dates throughout those years, it was unlikely that pre- and post-injury health care utilization and costs were related to other events occurring near the time of injury.

A priori, GHI utilization might be most frequent and GHI costs might be highest among injured workers with zero-cost WC medical claims, because those workers had no other treatment option. Alternatively, WC claimants with positive GHI costs might be more seriously injured and consequently might require extra treatment beyond what WC would pay. Therefore, we used two-tail tests of proportion and *t* tests to compare GHI utilization and costs between the two groups of workers. Then we used two-part model regression analysis to examine GHI cost difference between the two groups. In the two-part model, first we performed logistic regression using the whole sample to estimate the probability of a WC claimant to have an outpatient/drug/inpatient visit within the study period. Second, we calculated log linear regression model to estimate the outpatient/drug/inpatient GHI medical cost for those claimants who had an outpatient/drug/inpatient visit. We labeled those estimates *conditional* costs, because they were conditioned on seeking group medical care after injury. Finally, predicted values from the logistic regression and the conditional analysis were used to estimate *unconditional* predicted costs distributed across the entire sample, irrespective of post-injury GHI utilization. In simple terms, conditional costs are costs per worker among those who had costs, and unconditional costs are costs per worker averaged over all workers. Unconditional costs are usually used to project national figures, because these are estimated on the basis of the entire sample. See Asfaw and Souza[14] for the mathematical presentation of the model. We used this model to control for other factors that might influence GHI utilization. For instance, workers who received no benefit from their WC medical claims might be generally unhealthy compared with workers who were compensated. The model also helped control for pre-injury GHI utilization and costs. In addition, because of large numbers of zero costs (for those who did not use the outpatient or the inpatient GHI after injury), we could not use ordinary least squares methods to estimate the post-injury GHI costs. Predicted GHI cost estimates were calculated separately for outpatient, drug, and inpatient care. For presentation, log-transformed costs were retransformed to their original scale by using Duan's[15] smearing factor.

RESULTS

Pre-/Post-Injury GHI Utilization Preliminary Analysis

In the preliminary analysis, we compared the pre- with post-injury outpatient GHI costs, and the results showed that the post-injury outpatient GHI cost returned to the pre-injury outpatient GHI-cost level by the fourth month ($t = 1.6$; $\Pr(|T|>|t|) = 0.11$). In the case of

inpatient costs, the pre- to post-injury GHI cost difference vanished in the third month (t = 0.89; Pr($|T|>|t|$) = 0.3719). Therefore, we observed outpatient costs for 3 months and inpatient costs for 2 months after injury. On the basis of these results, we did not consider injuries that occurred before May 1, 2002, and after August 31, 2005, in the outpatient case and before April 1, 2002, and after September 30, 2005, in the inpatient case. This helped us observe the pre-/post-injury outpatient and inpatient GHI costs of all injured workers for full 3 and 2 months, respectively.

Descriptive statistics are presented in Table 1. As shown in the table, 15.9% of WC claimants received no medical payments from the WC program. The claims of union members were more likely to be positive-cost (85.9%) than the claims of nonunion members (82.3%). The medical claims of female injured workers were more likely to be zero-cost (19.2%) than those of their male counterparts (13.9%).

Figure 2 presents the outpatient, drug, and inpatient GHI utilization results. In the 3 months before an occupational injury, 53.9% of workers with positive-cost WC medical claims and 61.6% of workers with zero-cost WC medical claims used the outpatient GHI at least once. Within 3 months after an occupational injury, GHI utilization for outpatient services increased to 61.2% and 74.1% for workers with positive- and zero-cost WC medical claims, respectively. In both groups, the pre- to post-injury increase in GHI utilization for outpatient services was statistically significant (two-sample tests of proportion: Z = 11.64 [$P < 0.001$] and Z = 8.49 [$P < 0.001$], respectively). Between groups, the pre- to post-injury difference in GHI utilization was significantly larger for WC claimants with zero-cost WC medical claims than for those with positive-cost WC medical claims (unpaired two-sample t test with unequal variances: t = 3.37; $P < 0.001$). Similar patterns were observed for drug claims (outpatient panel of Figure 2).

The last panel of Figure 2 presents the inpatient GHI utilization results. Nearly 0.4% of injured workers with positive-cost WC medical claims and 0.5% of workers with zero-cost WC medical claims used GHI for inpatient services at least once within 2 months before an occupational injury. Within 2 months after injury, the percentage of injured workers who used GHI at least once increased to 0.9% and 2.0% for the groups with positive- and zero-cost WC medical claims, respectively. In both groups, the pre- to post-injury increase in GHI utilization for inpatient services was statistically significant (two-sample tests of proportion: Z = 4.83 [$P < 0.001$] and Z = 3.71 [$P < 0.001$], respectively). Between groups, the pre- to post-injury increase for zero-cost WC medical claimants was larger than that of positive-cost WC medical claimants (unpaired two-sample t test with unequal variances: t = 3.40; $P < 0.001$).

Multivariate Analysis

Group Medical Health Insurance Utilization—Separate logistic models were estimated to examine factors that affect outpatient, drug, and inpatient GHI utilization. The results are presented in Table 2. In both models, the Wald χ^2 values indicate high probability that the coefficients of the variables included in the model were jointly statistically different from zero (pr > 0.001). Most of the variables took the expected sign. Zero-cost WC medical claim status took the expected positive sign and was statistically significant at less than the

1% level. Holding all other factors constant, the odds of claimants with zero-cost WC medical claims using GHI outpatient services at least once within 3 months after injury was 49% higher than that of claimants with positive-cost WC medical claims. The effect was much stronger in the case of inpatient service utilization. Holding all other factors constant, the odds of using inpatient GHI within 2 months after injury were more than double for zero-cost WC medical claimants compared with positive-cost WC medical claimants.

As expected, pre-injury outpatient and inpatient visits predicted post-injury visits. Although the effect of age was relatively small (<2%) in both cases, female employees were more likely to have outpatient visits than their male counterparts. Hourly workers were less likely than salaried workers to use outpatient services. Union membership did not have a statistically significant impact on the utilization of the GHI after injury. Compared with the Northeast, WC claimants in other regions were less likely to have outpatient visits within 3 months after their injury. The odds of WC claimants in the finance, insurance, and real estate industry sector to have an outpatient visit within 2 weeks after injury were higher than that of their counterparts in the manufacturing industry sector (the reference category). Workers enrolled in Health Maintenance Organization and Preferred Provider Organization health plans were more likely to have an outpatient visit within 3 months after injury than workers enrolled in a comprehensive health plan (the reference category).

Predicted GHI Costs

We estimated outpatient, drug, and inpatient group medical costs of injured workers by using the two-stage process described in the Methods section. Figure 3 shows the effect of zero-cost WC medical claims on *conditional* and *unconditional* outpatient GHI costs. In the *conditional* case, if all WC medical claims of workers who had outpatient GHI costs after injury were zero, predicted outpatient GHI costs within 3 months after injury would be $1379 (95% CI: $1365 to $1393). On the contrary, if all WC medical claims of these workers were positive, predicted outpatient GHI costs within 3 months after injury would be $978 (95% CI: $968 to $989). The $401 (95% CI: $397 to $405) difference between these costs was statistically significant (*t* test; $t = 189$; $P < 0.001$). Therefore, zero-cost WC medical claims would be expected to increase *conditional* outpatient costs by 41%, controlling for all other factors in the analysis, including the 3 months pre-injury outpatient GHI costs.

The right panel of Figure 3 shows a stronger outcome in the case of *unconditional* outpatient costs. If all WC claims were zero-cost, predicted outpatient GHI costs within 3 months after injury, averaged across all workers in the sample, would be $1079 (95% CI: $1066 to $1093). If all WC claims were positive-cost, predicted outpatient GHI costs within 3 months after injury, averaged across all workers in the sample, would be $678 (95% CI: $669 to $687). The difference of $401 (95% CI: $397 to $406) was statistically significant (*t* test; $t = 138$; $P < 0.001$). Therefore, zero-cost WC medical claims would be expected to increase *unconditional* outpatient costs by 59%, controlling for all other factors in the analysis.

The results for GHI drug costs are presented in Figure 4. Zero-cost WC medical claims increased the conditional and unconditional GHI drug costs by $37 (95% CI: $37 to $39)

and $31 (95% CI: $31 to $32), respectively, within 3 months after injury, controlling for all other covariates.

Figure 5 shows the impact of zero- and positive-cost WC medical claims on *conditional* and *unconditional* inpatient GHI costs. In the *conditional* case, if all WC medical claims of workers who had positive inpatient group costs after injury were nonzero, inpatient GHI costs within 2 months after injury would be $9690 (95% CI: $9167 to $10,213). If all WC medical claims of these workers were zero, inpatient GHI costs within 2 months after injury would be $12,754 (95% CI: $12,065 to $13,442). The $3064 (95% CI: $2899 to $3229) difference between these costs was statistically significant (*t* test; $t = 37$; $P < 0.001$). Therefore, zero-cost WC medical claims would be expected to increase *conditional* inpatient costs by 32%, controlling for all other factors in the analysis.

The right panel of Figure 5 presents *unconditional* inpatient costs. The average difference in the inpatient GHI costs within 2 months after injury was $210 (95% CI: $181 to $238) for workers whose WC claims were zero-cost versus whose WC claims were positive-cost. This difference was statistically significant (*t* test; $t = 15$; $P < 0.001$). Therefore, zero-cost WC medical claims would be expected to increase *unconditional* inpatient costs by 168% within 2 months after injury, controlling for all other factors, including the 2 months before injury GHI inpatient costs.

Burden of Zero-Cost WC Medical Claims on the GHI

To examine the overall burden of zero-cost WC medical claims on GHI, we extrapolated our cost estimates following zero-cost WC medical claims to national injury figures. The percentage of Americans aged between 18 and 65 years with employer-sponsored health insurance between 2002 and 2005 was around 64.5%.[16] According to the Bureau of Labor Statistics, 1.3 million nonfatal occupational injuries and illnesses cases with days away from work, job transfer, or restriction were reported per year between 2002 and 2005.[12] If we assume that there is no systematic difference in the incidence of occupational injuries between workers with and without employer-sponsored health insurance, 0.84 million (1.3 million × 0.645) workers with employer-sponsored health insurance were injured per year. On the basis of data collected from 10 states, Bonauto et al[17] estimated that the medical expenses of 39% of injured workers were not paid by WC insurance systems. On the basis of these figures, we estimated that no WC medical claims were paid to 0.33 million (0.84 million × 0.39) workers per year, which added $132.3 million (0.33 million × $401), $10.2 million (0.33 million × $31), and $69.3 million (0.33 million × 210) medical bills per annum on the GHI in terms of outpatient, drug, and inpatient costs, respectively. The costs could be significantly higher if we considered workers who were inadequately compensated by the WC system.

DISCUSSION AND CONCLUSION

Several studies report that, because of various reasons, most injured workers do not file for WC benefits.[6,9,10] Application for WC benefits also might not result in payments. For instance, in our sample, 12,020 injured workers filed for WC benefits between 2002 and 2005, but only 84.1% had positive medical payments. Those zero figures are relatively small

compared to the rejection rates reported by similar studies, because we considered only injured workers whose WC claims were accepted while most other researchers considered all injured workers irrespective of their application status.

Our results indicate that the medical costs of a significant portion of injured workers might not be covered by WC programs. From the perspective of WC companies, WC medical claims could be zero if claimants do not require medical intervention or a visit to a doctor at all when the claim was filed. In our data, 15.9% of WC claimants had zero-cost WC medical claims. Other studies also reported similar zero-cost WC medical claims. Hashemi et al[18] examined WC claims data received from a large insurer (with a 10% share of the private US WC market) and found that 15.4% of the claims were zero-cost claims (claims with no payment for either medical or indemnity expenses). They also showed that the percentage of zero-cost claims increased from 15.2% to 17.4% between 1988 and 1996. Webster and Snook,[19] Hashemi et al,[20] MacDonald et al,[21] Lombardi et al,[22] Lombardi et al,[23] and Kim et al[24] also reported zero-cost WC medical claims. The literature shows that zero-cost WC medical claims are common for less-acute injuries such as back injuries.[21] Hashemi et al[18] reported that the share of zero-cost WC medical claims was 23.4% in low back pain claims. Workers' compensation medical claims could also be zero for some repeated musculoskeletal injuries if doctors advise workers to take rest for sometime.

If injured workers later need medical care, they would pay all the costs outside the WC system. Generally, medical expenses not covered by WC system might be paid by GHI, the public (eg, through Medicaid, ED visits, etc), or workers themselves. This study focused only on the effect of zero-cost WC medical claims on GHI. In our data set, we do not have information about injured workers who applied for WC benefits but had their claims rejected. At the same time, while we can guess that injured workers filed for WC medical benefits, believing that their injury was work-related, we did not have information on why their WC medical claims were zero. Consequently, this study is not a comprehensive characterization of the cost-shifting potential of WC programs but does provide information about some of the costs assumed by GHI. The cost is substantial, given that GHI utilization and costs increased post-injury regardless of whether a WC medical claim was zero or positive. The increases were highest after zero-cost WC medical claims and potentially translate into hundreds of millions of dollars in annual GHI costs in the first 2 to 3 months after an occupational injury.

Our results showed some differences in utilization rates of outpatient, drug, and inpatient services before injury between workers with zero- and positive-cost WC medical claims. This implies that the before-injury GHI utilization of injured workers should be taken into account when after-injury GHI utilization and costs are estimated. The descriptive statistics showed that post-injury differences were much higher than pre-injury differences except in the case of drug claims. The post-injury outpatient and inpatient GHI utilization of workers with positive-cost WC medical claims increased by 13.5% and 225%, respectively. For workers with zero-cost WC medical claims, the outpatient and inpatient GHI utilization increased by 20.3% and 400%, respectively. These differences might indicate the effect of under-compensation and absence of compensation from the WC system, respectively. The regression results confirmed the descriptive results. After controlling for the pre-injury

incidence of outpatient and inpatient visits and other covariates, the likelihood of injured workers with zero-cost WC medical claims to use the GHI outpatient and inpatient services were 49% and 200% higher than injured workers with positive-cost WC medical claims, respectively.

Similar results were observed in the case of GHI utilization costs. In the conditional case, zero-cost WC claims would be expected to increase GHI outpatient, drug, and inpatient costs by 41%, 41%, and 32%, respectively, controlling for all other factors in the analysis. Whether these zero-cost WC medical claims are warranted or unwarranted is a separate question from their costly implications for GHI. Our results suggest that the effects of zero-cost WC medical claims could not be contained within the WC system. If WC provides inadequate coverage, as evidenced by the increase in GHI costs of workers with positive-cost WC medical claims, workers will seek treatment using other insurance. Our key finding is that zero-cost WC medical claims have repercussions for other insurance systems and society, and their economic implications are substantial. Our national estimates showed that zero-cost WC claims added $212 million medical bills to the GHI per year. This is likely an underestimate if we assume that the Bureau of Labor Statistics system undercounts the number of nonfatal occupational injuries.[25,26]

The major strength of this study was its ability to take into account pre-injury GHI utilization and cost of injured workers. This helped us control for the impact of different factors that might affect the health status and GHI differences between injured workers with zero- and positive-cost WC medical claims. Inclusion of outpatient, drug, and inpatient visits was also one of the strengths in the article.

The results of this study should be interpreted with limitations in mind. First, the data we used were restricted to employees covered by employer GHI. Thus, this study did not examine the effects of zero-cost WC medical claims on workers with individual coverage, or without any coverage, which could be substantially higher than our estimate. Second, because of lack of data, we did not consider injured workers whose WC medical claims were completely rejected. Third, we did not have any information about why the WC medical claims were zero. If most of zero-cost claims were not work-related, our results could overestimate the impact of zero-cost WC medical claims on GHI. Future detailed national studies are needed to quantify legitimate WC claims, using *International Classification of Diseases* codes and other methods to calculate the costs that would be shifted from WC to other insurance systems, workers, and the public. Fourth, because of lack of information, we could not control for the effects of personal characteristics such as education, race, income, and comorbidity. Preexisting health conditions such as diabetes could aggravate the negative effects of workplace injuries on the health status of injured workers, and this might add additional burden on the GHI. Finally, our data came from large employers who are clients of Thomson Reuters, and these employers are more likely to be self-insured for their GHI and, depending on the states where they are operating, for WC insurance. Therefore, our findings may not be generalizable to all employers.

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Learning Objectives

- Identify factors affecting the likelihood of “zero-cost” workers’ compensation claims.
- Summarize the new findings on group health insurance (GHI) utilization and costs associated with “zero-cost” workers’ compensation claims.
- Discuss the estimated rate of zero-cost workers’ compensation claims and their economic impact on other insurance providers and society.

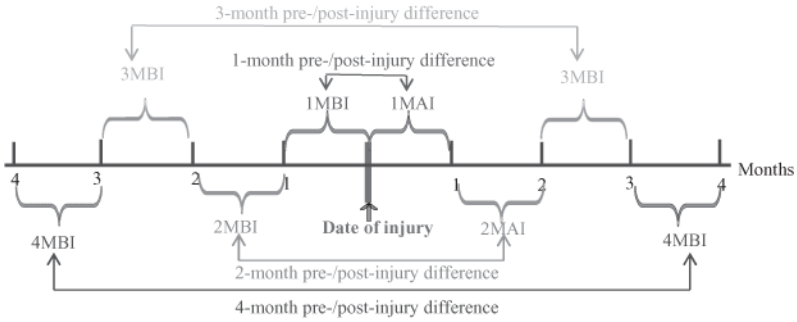

FIGURE 1.
Time frame. MAI, months after injury; MBI, months before injury.

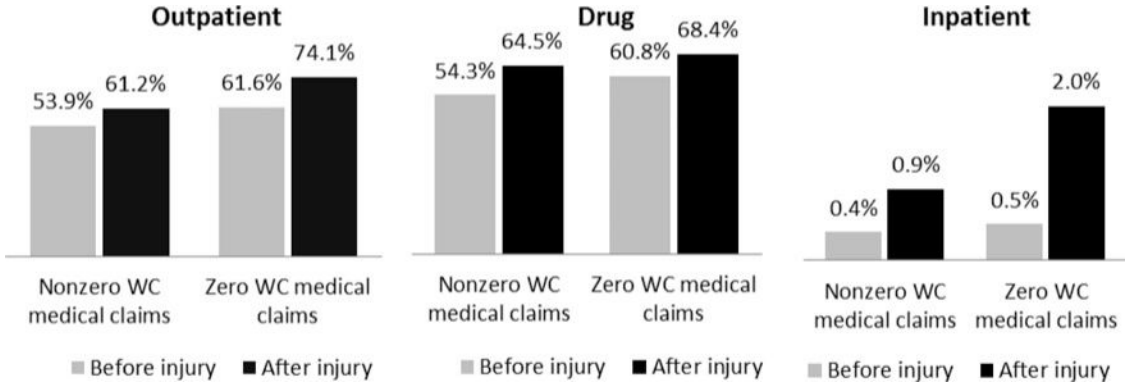

FIGURE 2.

Utilization of the group health insurance within 3 months (outpatient and drug) and within 2 months (inpatient) before and after the incidence of occupational injury by WC medical claim status. WC, workers' compensation.

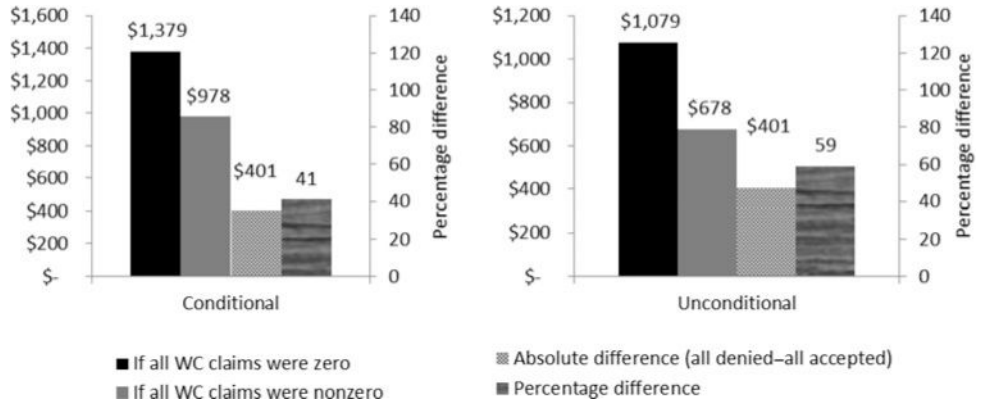

FIGURE 3.

Two-part model results for conditional and unconditional outpatient group health insurance costs within 3 months after injury. WC, workers' compensation.

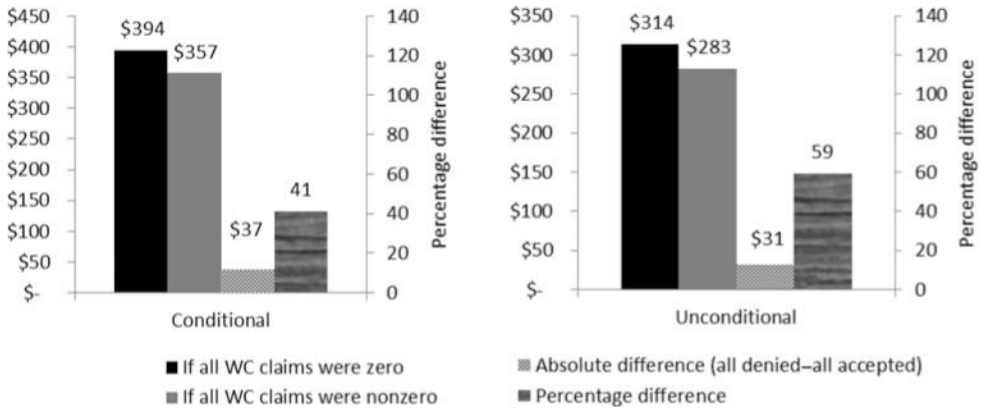

FIGURE 4.

Two-part model results for conditional and unconditional drug group health insurance costs within 3 months after injury. WC, workers' compensation.

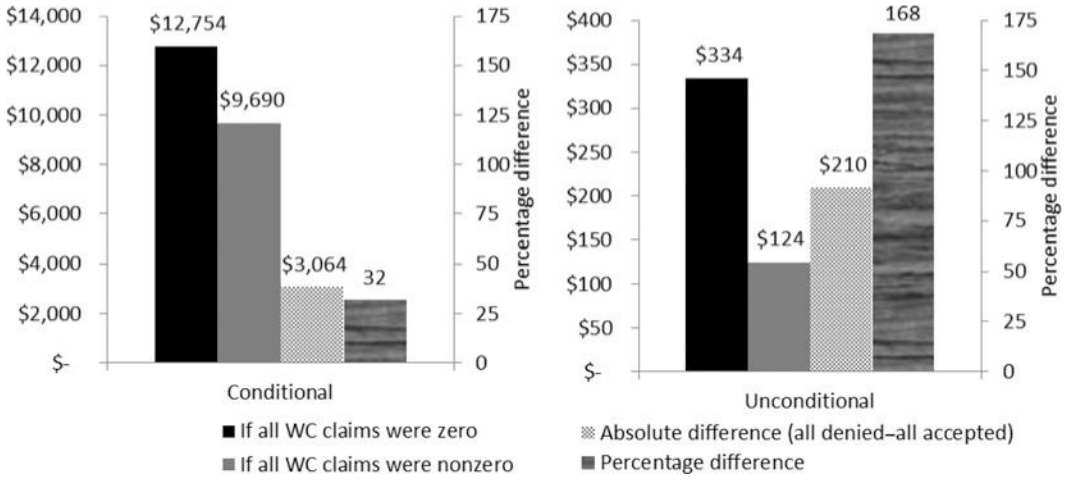

FIGURE 5.

Two-part model results for conditional and unconditional inpatient group health insurance costs within 2 months after injury. WC, workers' compensation.

TABLE 1

Descriptive Statistics

Variable	Injured Workers With	
	Zero-Cost WC Medical Claims	Nonzero-Cost WC Medical Claims
Number of observations	1,965	10,064
Number of weighted observations	201,021	1,066,315
Number of weighted observations, %	15.86	84.14
Median age, yr	43	43
Sex, %		
Female	19.24	80.76
Male	13.86	86.11
Union status, %		
Not member	17.69	82.31
Member	14.11	85.89
Occupational status, %		
Hourly worker	13.94	86.06
Salaried worker	27.36	72.64
Region, %		
Northeast	21.79	78.21
North Central	14.42	85.58
South	15.37	84.63
West	12.51	87.49
Health plan type, %		
Comprehensive	8.58	91.42
HMO	20.14	79.86
POS	13.95	86.05
PPO	16.68	83.32
Others comp EPO	50	50
Industry, %		
Manufacturing	15.87	84.13
Transport, communication, and utilities	13.01	86.99
Finance, insurance, real state	52.61	47.39
Service	19.38	80.62

EPO, Exclusive Provider Option; HMO, Health Maintenance Organization; POS, Point of Service; PPO, Preferred Provider Organization; WC, workers' compensation.

TABLE 2

Determinants of Outpatient GHI Medical Utilization Within 3 Months and Inpatient GHI Medical Utilization Within 2 Months After Injury: Logistic Regression Results

	Utilization of the Group Health Insurance			
	Outpatient (Within 3 Months After Injury)		Inpatient (Within 2 Months After Injury)	
Variables	**OR**	**95% CI**	**OR**	**95% CI**
Zero-cost WC medical claim	1.494***	1.313–1.700	2.004***	1.336–3.005
Outpatient visit 3 months before injury	3.261***	2.980–3.568		
Inpatient visit 2 months before injury			5.919***	2.015–17.39
Men	0.574***	0.515–0.638	1.02	0.995–1.040
Age	1.016***	1.011–1.020	1.23	0.781–1.934
Paid hourly (1 if yes and 0 otherwise	0.867*	0.739–1.018	0.66	0.330–1.308
Member of a union	1.077	0.927–1.250	1.50	0.825–2.717
Region				
Northeast				
North Central	0.760***	0.659–0.876	0.71	0.400–1.254
South	0.849**	0.740–0.974	1.32	0.791–2.218
West	0.745***	0.613–0.905	0.83	0.337–2.042
Industry				
Manufacturing				
Transport, communications, and utilities	0.778**	0.633–0.957	1.54	0.765–3.113
Finance, insurance, and real estate	1.854***	1.165–2.949	1.07	0.299–3.856
Service	0.99	0.834–1.174	0.76	0.320–1.789
Health plan type				
Comprehensive				
HMO	1.401***	1.129–1.738	1.36	0.586–3.143
POS	1.115	0.907–1.371	0.75	0.323–1.738
PPO	1.267**	1.000–1.604	1.63	0.633–4.194
Constant	0.813		0.00305***	
Observations[a]		12,020	12,020	
Wald χ^2 ($P > \chi^2$)		1,188 (0.001)	62 (0.0001)	
Pseudo R^2		0.11	0.03	
Log pseudolikelihood		−744,787	−72,210	

*$P < 0.1$

**$P < 0.05$

***$P < 0.01$.

[a]Nine observations were not included because of missing values for some of the variables.

CI, confidence interval; GHI, group health insurance; HMO, Health Maintenance Organization; POS, Point of Service; PPO, Preferred Provider Organization; OR, odds ratio; WC, workers' compensation.