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Task 3

Long-Term Follow Up of Original COHE Cohorts

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Long-Term Follow Up of Original COHE Cohorts

Executive Summary

This report summarizes the results of an analysis conducted by the University of Washington research team to evaluate the effects on disability and costs associated with the Centers of Occupational Health and Education (COHE) over an additional 2-3 year follow-up period. In addition, we analyzed new outcome measures not previously examined, including rejected claims, reopened claims, use of attorneys, protests and receipt of pensions. The same initial cohorts of cases analyzed previously for both pilot sites (Renton and Spokane) were analyzed here. To conduct this analysis, we tested the same multivariate statistical models as were tested previously. Findings are presented in the form of descriptive information and adjusted mean disability days and costs (medical costs and disability payments combined).

Key findings of the long-term follow-up analysis were:

- Over the extended follow-up period, the average COHE case had 9 fewer disability days than comparison-group cases.
- Over the extended follow-up period, estimated cost savings per claim for Renton and Spokane, respectively, were \$819 and \$1,279. These figures represent an increase in cost savings of approximately 50% from the initial one-year follow up. The increased cost savings result, in part, from more claims remaining open in the comparison groups.
- The analysis of new outcome measures revealed large, and with one exception, statistically significant differences favoring the COHEs. The COHEs had fewer rejected claims, fewer reopened claims, fewer protests, less frequent use of attorneys, and a lower pension rate.

The findings of this analysis add further evidence indicating the COHEs are having a positive effect in reducing disability burden for injured workers and improving the quality of care delivered to them through the workers' compensation system. This reduced disability burden should over time translate into cost savings for employers and the workers' compensation system.

Long-Term Follow Up of Original COHE Cohorts

Introduction

The University of Washington (UW) research team is conducting a series of analyses during the 2007-2009 biennium to enhance understanding of the operation and performance of the Centers of Occupational Health and Education (COHE), and to evaluate both longer term results and new cohort years for both the Renton and Eastern Washington COHEs. This report presents the findings of the first analysis, designed to assess the effects of the COHE on disability and costs over an additional 2-3 year follow-up period of the initial cohort. In addition to assessing the longer term impacts on disability duration and medical and disability costs, this analysis examines new outcome measures not previously analyzed. These measures include:

- Frequency of rejected claims
- Frequency of claim reopenings
- Filing of protests
- Hiring an attorney
- Receipt of pension for permanent total disability.

The initial COHE outcome evaluation assessed outcomes during a one-year follow-up period. This analysis extends the follow-up period from one to four years for the Renton COHE pilot and from one to three years for the Spokane COHE pilot. (The Spokane COHE started one year later; hence its follow-up period is one year less than Renton's.) Three types of analyses are presented in this report:

- Descriptive analyses of disability days and costs
- Statistical analyses that generate information on adjusted mean disability days and costs
- Descriptive analyses on five new outcome measures

The same cohorts (COHE and comparison-group) analyzed previously are analyzed here.

Methods

These analyses are based upon administrative data obtained from the Department of Labor and Industries (DLI). The Renton COHE's initial evaluation year was July 2003 to June 2004, while the Spokane COHE's initial evaluation year was July 2004 to June 2005. The data analyzed for this report were obtained in July 2007. Thus, the long-term follow-up period for Renton represents approximately four years (July 2003 through June 2007) or three years beyond the initial evaluation year (July 2003 to June 2004). The corresponding follow-up period for Spokane represents three years (July 2004 to June 2007) or two years beyond the initial evaluation year (July 2004 to June 2005).

The primary results presented in this report are based upon multivariate statistical analyses. As discussed in our previous deliverables, the COHE and comparison groups differ in regard to a number of factors that could influence outcomes, including worker age and sex, type of injury, type of provider and related factors. Thus, in comparing the two groups, it is necessary to adjust for these differences. The statistical model we tested for this analysis is similar to the model we tested for the combined report (Task 5). However, the new model used analysis of variance procedures instead of regression procedures and excluded a small percentage of rejected claims that were included in prior analyses. The statistical analysis controlled for the following variables: (1) worker age, sex and type of injury; (2) provider type, (3) size of employer, (4) industry type, and (5) baseline provider costs (disability and medical costs combined).

To simplify the interpretation of the results of the statistical analysis, we report findings in the form of bar graphs representing adjusted mean values. In preparing the report, we have purposely kept descriptive information and tables to a minimum. Information regarding the number of cases analyzed (all cases and compensable cases [4 or more days of time loss] by injury condition) is included in the appendix.

Results

Table 1 presents information regarding the percentage of cases (all injuries) on time loss at different points in time during the extended follow-up period. Initially 5.6% of all COHE cases at Renton were on time loss at 30 days. This declined to 1.7% at 12 months, and declined further to 0.7% at 36 months. The corresponding percentages for the Renton comparison group were 8.0%, 3.2% and 1.5%. The same general pattern is shown for the Spokane pilot, with statistically significant differences ($p < .01$) in both sites favoring the COHE. What is clear from Table 1 is that only a very small (but costly) percentage of cases remain on time loss at 24 months or later.

Table 1. Percent of Cases on Time Loss at Different Follow-up Points

Follow up time	Renton		Spokane	
	COHE (n=10,725)	Comp. Group (n = 11816)	COHE (n=7,359)	Comp. Group (n=3,865)
30 days	5.6%**	8.0%	5.3%**	8.2%
90 days	3.7%**	5.8%	4.1%**	6.3%
180 days	2.7%**	4.6%	3.1%**	4.8%
12 months	1.7%**	3.2%	2.5%**	3.5%
18 months	1.4%**	2.4%	1.9%**	2.9%
24 months	1.1%**	2.1%	1.4%**	2.6%
36 months +	0.7%**	1.5%	---	---

Differences are statistically significant: * $p < .05$ ** $p < .01$

+ Follow-up time for Spokane extends 24 months rather than 36 months because this COHE site started one year after the Renton COHE site.

Statistical Analysis

We conducted statistical analyses to compare COHE and comparison-group cases with regard to disability days and costs, controlling for the factors noted earlier. These new estimates, representing adjusted mean disability days and costs (medical costs and disability payments combined) for the extended follow-up period, are then compared to our previous estimates for the initial (one-year) follow-up period. As discussed earlier, our prior analyses used regression techniques rather than analysis of variance techniques to assess outcomes and did not report findings in terms of adjusted mean values. We report adjusted mean values here because this measure provides an easy method of comparing changes in outcomes from the original follow-up period to the extended follow-up period. Because the statistical model used here differs slightly from the model used earlier and because a small percentage of rejected claims were excluded from this analysis but included in the previous analyses, the results shown here pertaining to cost savings for the initial evaluation year are not identical to those generated earlier from the regression analyses. The results of the current analysis are summarized in the figures below.

Figures 1 and 2 present information on adjusted disability days for COHE and comparison-group cases for the initial one-year follow-up period and the extended follow-up period. As shown in Figure 1, during the initial one-year follow up, Renton COHE cases had 19.7 disability days per claim, compared to 25.8 days for comparison-group cases ($p < .01$). The (adjusted) disability days increased for both groups during the extended follow-up period, reflecting the small percentage of cases on long-term time loss (see Table 1), but the increase was greater for the comparison group. In sum, the difference in disability days increased by about 50% from 6 days during the initial follow-up period (25.8 days versus 19.7 days) to 9 days during the extended follow-up period (35.8 days versus 26.7 days). A similar pattern is observed for Spokane (Figure 2), with the COHE cases having an average of 7 fewer days of time loss at one year and 10 fewer days after three years of follow-up.

Figure 1. Adjusted Disability Days per Claim for One- and Four-Year Follow Up, Renton COHE

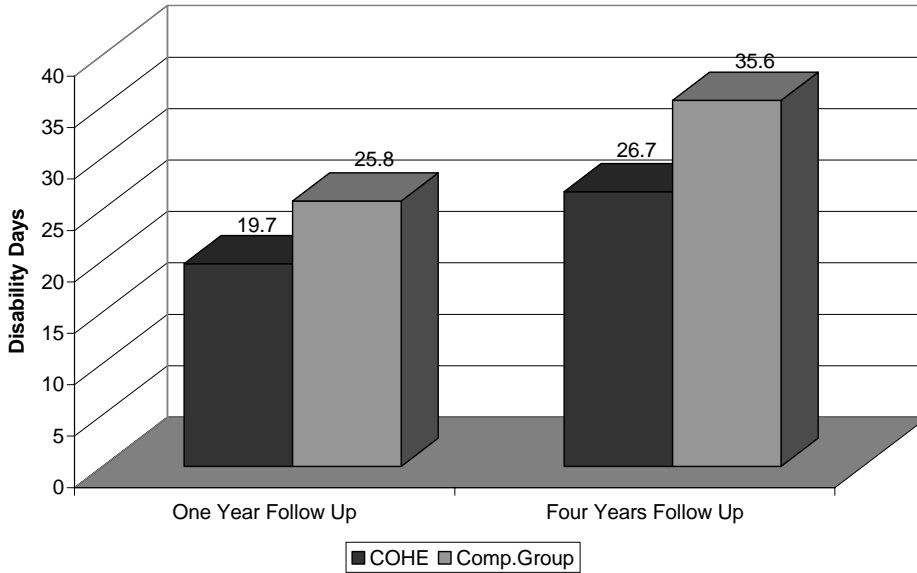
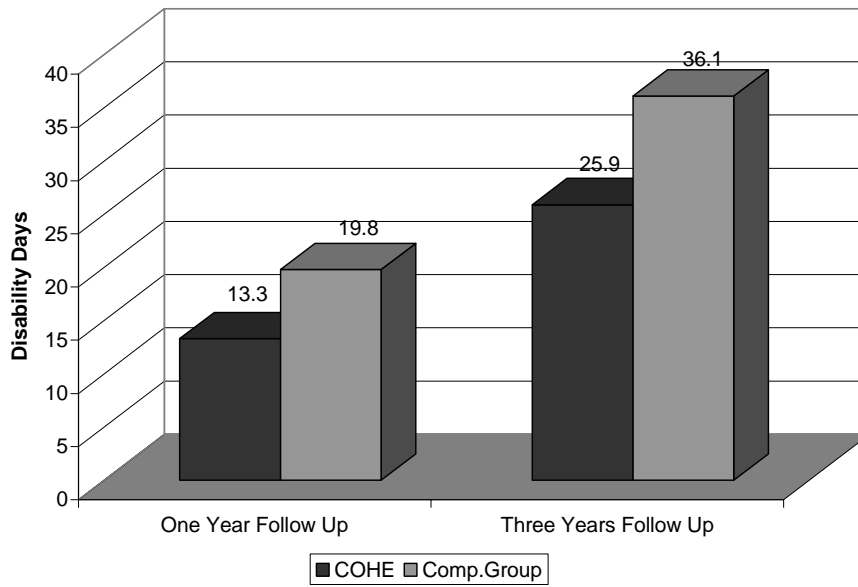
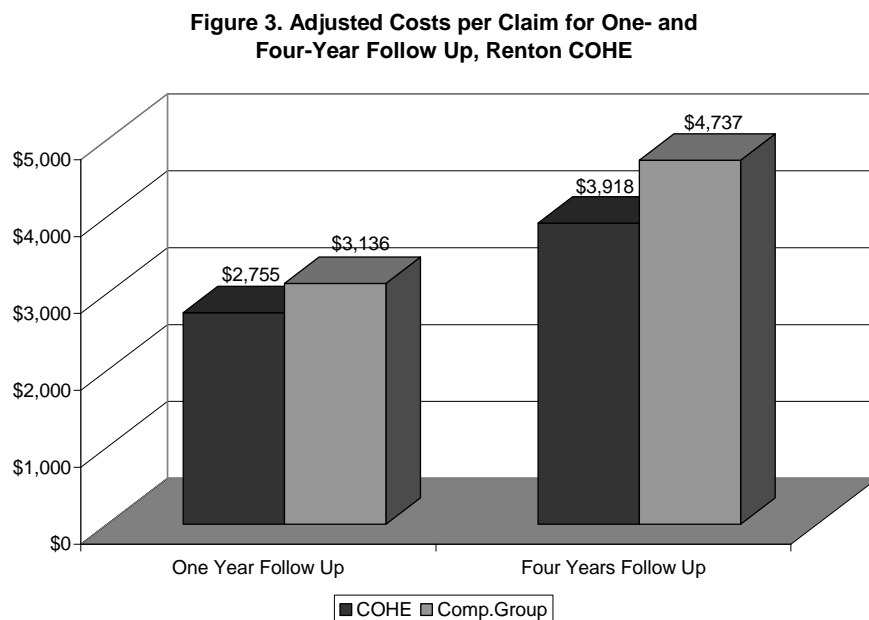


Figure 2. Adjusted Disability Days per Claim for One- and Three-Year Follow Up, Spokane COHE



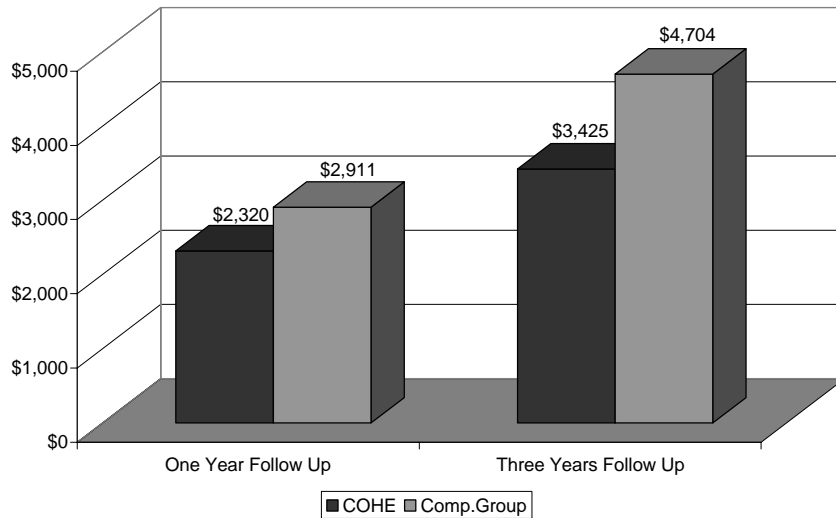
Figures 3 and 4 present similar information showing differences in adjusted costs (medical and disability costs combined) for the initial and extended follow-up periods. As shown in Figure 3, adjusted costs for COHE cases for Renton during the initial one-year follow-up period were \$2,755 compared to \$3,136 for comparison-group cases. Thus, COHE cases, on average, had claim costs that were \$381 per claim lower than comparison-group cases ($p < .01$). Costs increased for both groups during the extended follow-up period but the increase was greater for the comparison group. Thus, the difference in costs, or cost savings, became greater. The estimated cost savings associated with the Renton COHE increased from \$381 per claim to \$819 per claim (Figure 3).



A similar pattern is shown for Spokane (Figure 4) except the increase in cost savings is even greater. During the initial follow-up period, adjusted costs for the COHE and comparison group,

respectively, were \$2,320 and \$2,911, and the corresponding estimated cost savings (difference between the groups' costs) associated with the COHE was \$591. Over the extended follow-up period, the estimated cost savings increased to \$1,279 per claim (\$4,704 - \$3,425). Thus, at both pilot sites cost savings associated with the COHE roughly doubled during the extended follow-up period.

Figure 4. Adjusted Costs per Claim for One- and Three-Year Follow Up, Spokane COHE



The differences in costs shown in Figures 3 and 4 reflect, in part, differences in the number of claims remaining open during the extended follow-up period. A total of 321 claims (1.4%) remained open in Renton throughout the follow-up period, and 291 claims (2.6%) remained open in Spokane. (Some claims, not included in these counts, were reopened during the extended follow-up period. These are examined below.) These open claims accounted for 37% of total costs (medical costs and disability payments combined) and 45% of total disability days for Renton during the extended follow-up period. In Spokane, these open claims accounted for 29% of total costs and 38% total disability days. Thus, a very small proportion of claims (< 3%) that remained open during the follow-up period accounted for a significant fraction of the total disability burden (and costs) incurred by injured workers during the extended follow-up period.

In both pilot sites, the proportion of claims remaining open in the comparison-group was much greater ($p < .01$) than in the COHE group.

The accumulation of costs over the extended follow-up period affords another method of considering how these costs (and disability days) are distributed among the population of injured workers at the two pilot sites. Research on other patient populations has shown that a small proportion of costly cases usually account for a large fraction of total costs. This has only been documented for a workers' compensation population covered under a large private insurer (Hashemi et al.¹). In Renton, the most costly 5% of the cases accounted for 67% of total costs (medical and disability combined) over the follow-up period. The most costly 10% of the cases accounted for 80% of all costs. In Spokane, the same pattern is observed, with the most costly 5% of the cases accounting for approximately 70% of total costs. Analyzing the factors associated with these "high cost" cases is beyond the scope of this report. However, two observations are worth noting: (1) in both pilot sites "high cost" cases (most costly 5%) were more likely ($p < .01$) to occur in the comparison group; and (2) high cost cases were more likely ($p < .01$) to occur among the group of injured workers employed in small size firms having fewer than 25 full time equivalent (FTE) employees. Small size firms usually have less opportunity for job accommodation or modified duty. The fact that high cost cases are more likely to arise in small-size firms may reflect barriers to return to work resulting from the lack of job accommodation. This may represent a target for future COHE quality improvement intervention.

Other Outcome Measures

As part of the data analyzed for this report of extended follow up, we gathered information on five new outcome measures: (1) rejected claims, (2) protests (employer and worker protests combined), (3) claim reopenings, (4) use of attorney, and (5) pensions. Table 2 shows descriptive information on these measures for the COHE and comparison groups. The table shows percentage values for the first four measures. Because there were few pensions awarded during the follow-up period, we provide information for this measure in the form of a rate, that is, the number of pensions per 10,000 claims.

¹ Hashemi L, Webster BS, Clancy EA. Trends in disability duration and cost of workers' compensation low back pain claims (1988-1996). J Occup Environ Med. 1998 Dec; 40 (12):1110-9.

As shown in Table 2, each of the five outcome measures exhibited differences favoring the COHE. Except for pensions, where the absolute numbers of pensioned cases were very small, these differences achieved statistical significance ($p < .05$). Though the percentage values are generally small (under 10%) and hence the differences in the percentage values appear small, on a relative basis these differences are actually quite large. For example, in Renton 1.2% of injured workers in the COHE group hired an attorney compared with 2.4% of workers in the comparison group, a difference of 1.2%. But on a relative basis, injured workers in the comparison group were twice as likely to hire an attorney for their claim. Similarly, in Spokane 5.3% of the COHE claims were rejected compared with 8.2% of the claims in the comparison group, a difference of 2.9%. But on a relative basis, comparison group claims were 55% more likely to be rejected than COHE claims. Though the differences in pension rates are not statistically significant (due primarily to the small number of pensioned cases) the differences are large in magnitude. In both pilot sites, the pension rate for the comparison group was twice as high as the COHE.

Table 2. Selected Performance Measures

Performance Measure	Renton		Spokane	
	COHE (n=10,725)	Comp. Group (n = 11,816)	COHE (n=7,359)	Comp. Group (n=3,865)
Rejected claim	8.3%**	12.4%	5.3%*	8.2%
Protest	4.7%**	6.5%	4.1%**	6.3%
Claim reopenings	0.9%*	1.2%	0.7%*	1.2%
Use of attorney	1.2%**	2.4%	3.1%**	4.8%
Pension rate (pensions per 10,000 claims)	9.7	18.9	8.1	15.5

Differences are statistically significant: * $p < .05$ ** $p < .01$

Summary

This deliverable analyzed disability days, costs and other related outcome measures for the original COHE and comparison-group cohorts over an additional 2-3 year follow-up period. At both pilot sites, the analysis showed the estimated cost savings increased from the earlier one-year follow-up period. This increase reflected the fact that (1) more claims remained opened in the comparison groups throughout the extended follow-up period and (2) more claims were reopened in the comparison groups.

This deliverable also documented the fact that a small percentage of “high cost” claims account for a great proportion of total disability days and consume a great proportion of resources. This fact highlights the importance of effective secondary prevention efforts aimed at reducing long-term disability for injured workers. The challenge is improving understanding of the risk factors that contribute to long-term disability and then targeting interventions to reduce these risk factors. This could also include analysis of how long-term COHE and non-COHE comparison cases characteristically differ.

Finally, this deliverable presented information for a set of new outcome measures. For each of these measures, differences were found favoring the COHE. These outcome measures, coupled with other analyses presented here, add to the weight of evidence indicating the COHE intervention is having an important effect improving the quality of care delivered to injured workers, reducing their disability burden and, in the process, saving costs.

Appendix

Table A1. Renton Cases Analyzed for Long-Term (Four Year) Follow Up

Injury/Condition	All Injuries		Compensable Injuries	
	COHE	Comp. Group	COHE	Comp. Group
Back sprain (n = 3,480)	1,514	1,966	374	628
Carpal Tunnel Syndrome (n = 380)	87	293	38	121
Fractures (n = 837)	480	357	179	148
Other Sprains (n = 5,075)	2,361	2,714	521	747
All others (n = 12,490)	6,123	6367	674	965
Unknown (n = 279)	160	119	25	30
All Injuries (n = 22,541)	10,725	11,816	1,811	2,639

Table A2. Spokane Cases Analyzed for Long-Term (Three Year) Follow Up

Injury/Condition	All Injuries		Compensable Injuries	
	COHE	Comp. Group	COHE	Comp. Group
Back sprain (n = 1,520)	981	539	228	170
Carpal Tunnel Syndrome (n = 204)	84	120	39	59
Fractures (n = 352)	249	103	78	47
Other Sprains (n = 2,319)	1,577	742	324	206
All others (n = 6,829)	4,468	2,361	444	391
All Injuries (n = 11,224)	7,359	3,865	1,113	873