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EVALUATION OF CALIFORNIA'S 24-HOUR COVERAGE PILOT DEMONSTRATIONS

Final Report

submitted to the

Robert Wood Johnson Foundation
and the
California Department of Industrial Relations,
Division of Workers' Compensation

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SECTION 1: PROJECT OVERVIEW

In response to rising occupational health care costs within workers' compensation programs, states during the 1990s introduced cost containment strategies adapted from non-occupational employment-based group health insurance plans. In particular, managed care approaches and techniques gained popularity with workers' compensation health insurers. An early evaluation of Florida's experience with workers' compensation managed care suggested that this strategy could have significant potential for controlling the workers' compensation medical costs (Appel and Borba, 1994).

A natural extension of these efforts integrates the health care component of workers' compensation with traditional managed care group health, thus allowing employees to seek treatment for occupational injuries from their primary care physician or from an occupational health care specialist affiliated with their regular non-occupational health care provider's network. These programs, known as 24-hour coverage, were expected to improve the continuity of care provided to employees, and to produce lower costs, better health outcomes, greater satisfaction with health care services, and lower rates of litigation among employees who file workers' compensation claims. Because 24-hour programs effectively lock patients into these plans and their provider networks until the next open enrollment period, they make capitation-based managed care more feasible for traditional HMOs and more attractive for employers who might otherwise find prepaid fees undesirable. This has the potential to reduce employer costs further by taking advantage of greater efficiencies achieved by managed care providers.

In 1993, the State of California established provisions for the approval of a set of 24-hour coverage pilot programs in four counties within the state. The pilot programs were legislated at a time when employers' costs for workers' compensation were rising rapidly; from approximately \$8 billion in 1988 to \$11 billion in 1993. By 1995, however, when enrollment in the pilot programs began, overall workers' compensation costs had dropped dramatically below the 1988 levels. This dramatic reduction in costs was largely due to the introduction of competitive bidding in the market for workers' compensation insurance, which resulted in employers receiving substantial discounts on their premiums at the same time the pilot programs were being established. These reduced premiums substantially reduced employer interest in the 24-hour pilot programs, because considerable savings were available through traditional fee-for-service forms of workers' compensation insurance. Subsequently, enrollment in the pilot programs was lower than originally expected. By the end of the pilot program in 1997, over 65 employers and nearly 8,000 employees in participating firms had been enrolled in the pilot programs.

The pilot programs were authorized in 4 counties: Sacramento in Northern California, Santa Clara in Central California, and Los Angeles and San Diego in Southern California. Each was a large, geographically and industrially diverse area. The vast majority of participating employers and employees were signed up with Kaiser in Northern and Southern California, with a small percentage enrolled in Maxicare.

Kaiser's 24-hour program was known as Kaiser on the Job (KOJ). Injured workers enrolled in KOJ usually received treatment from staff physicians specializing in occupational medicine for their workers' compensation injuries, although they could request to be treated by primary care provider. All

physicians had access to both occupational and nonoccupational records. Employers paid a monthly capitation fee to Kaiser that was separate from the premium paid for group health. Within Maxicare, a nonoccupational IPA provided both nonoccupational and occupational services for employees enrolled in the 24-hour programs. The IPA was “mentored” by a workers’ compensation organization that provided training and technical advice. The primary care physicians treated work injuries and therefore had access to all records. Employers paid Maxicare on the basis of the official medical fee schedule.

EVALUATION PROJECT OVERVIEW

This report contains the evaluation of California’s 24-hour coverage pilot programs conducted by the UCLA Center for Health Policy Research with support from the California Division of Workers’ Compensation and the Workers’ Compensation Research Initiative of the Robert Wood Johnson Foundation. Our evaluation addressed two major research questions: (1) Did 24-hour coverage reduce medical claims costs?, and (2) Were employees enrolled in 24-hour coverage representative of the workforce in their firms, or were they systematically different from employees who chose not to enroll? The remainder of this report is organized to address these two major research questions. Section 2 includes a detailed analysis of workers’ compensation claims covering the period from 1992 to 1997. This analysis compares claims from injured employees in the pilot firms who enrolled in 24-hour coverage with two comparison groups: (1) injured employees in the pilot firms not enrolled in 24-hour coverage, and (2) injured employees in a matching set of firms not participating in 24-hour coverage. Section 3 includes findings from a telephone survey of a random sample of employees in pilot firms who were interviewed regarding their reasons for electing to enroll or not to enroll in 24-hour coverage.

Overall, this evaluation was more complex than other state pilots programs because California adopted a strictly voluntary approach to pilot participation. The enabling legislation in California required that: (1) employers in the four pilot program counties join the program voluntarily, and (2) employees within firms participating in the pilot programs be allowed to choose whether they wish to enroll in 24-hour coverage. Other states allowed employers to decide for the firm as a whole or, where firms offered a choice among health plans, mandated enrollment in a pilot affiliated with their health plan choice. When enrollment is voluntary, pilots programs may be differentially attractive to high- or low-risk groups. Therefore, our enrollment survey was conducted to determine whether risk selection occurred in the California pilot programs. In the absence of this survey, the effects of risk selection might have been inappropriately attributed to the pilot program.

This evaluation reflects tasks performed by a team of researchers at the UCLA Center for Health Policy Research, RAND, and the UC Berkeley Survey Research Center. The following table lists the tasks performed by each organization as part of this evaluation, and the funding source for each task. Task 4, involving an analysis of non-economic outcomes among injured workers, was conducted separately by the California Division of Workers’ Compensation (DWC) and is not included in this report, but is available at <http://www.dir.ca.gov/dwc/dwcrep.htm>.

Table 1.1. Lead Responsibility And Funding Source For Different Tasks.

Research Tasks	Lead Responsibility	Funded by
1. Control group firms		
a. Identification	RAND	CA DWC Contract
b. Recruitment	UCLA	CA DWC Contract
2. Claims data base		
a. Obtain claims data from health insurers in EDI format	UCLA	CA DWC Contract
b. Analyze data	UCLA	CA DWC Contract
3. Enrollment survey		
a. Develop survey instrument	RAND	RWJ Grant
b. Field survey	UC Berkeley SRC	RWJ Grant
c. Analyze data	UCLA	RWJ Grant
4. Claimant outcomes survey		
a. Develop survey instrument	RAND/CA DWC	RWJ Grant
b. Field survey	UC Berkeley SRC	RWJ Grant
c. Analyze data	CA DWC	RWJ Grant

ACKNOWLEDGMENTS

Numerous individuals have collaborated to complete the various tasks under this project. Donna Farley, Grant Marshall, and Robert Bell of RAND developed the enrollment survey. The late Karen Garrett at the UC Berkeley Survey Research Center fielded the enrollment survey. Karen worked on cleaning the data from this survey right up until the time of her death; her dedication and spirit were a true inspiration. Linda Hoban, Mark Leveque, and Ester Liu of the State Compensation Insurance Fund (SCIF) provided the bulk of the claims data discussed in Section 2. Reena David, Hal Kopacek, and Therese Calegari of Kaiser worked to provide claims data from Kaiser. Glenn Shor and Linda Rudolph at the California Division of Workers' Compensation (DWC) provided valuable guidance as project officers. Natasha Razack at the UCLA Center for Health Policy Research developed the tables presented in Section 2.

This project was supported in part by the Robert Wood Johnson Foundation Workers' Compensation Research Initiative, Grant #027125, and the California Department of Industrial Relations, Division of Workers' Compensation, Contract #55305011.

SECTION 2: ANALYSIS OF WORKERS' COMPENSATION MEDICAL CLAIMS

PURPOSE: To determine if workers' compensation medical claims under 24-hour coverage were significantly lower than under fee-for-service.

MAJOR FINDINGS:

A. Pilot firms had a substantial cost advantage prior to joining the 24-hour coverage pilot programs, particularly among their Kaiser FFS claims.

In three of five categories of claims we examined, Kaiser FFS claims were significantly less costly (between 22.2 and 38.2%) than control firm claims. In four of five categories, non-Kaiser claims in pilot firms were significantly less costly (between 8.6 and 15.6%) than control firm claims. In three of five categories, Kaiser FFS claims were significantly less costly than non-Kaiser claims within the pilot firms.

B. Between 1992 and 1997, the average cost of claims declined more within control firms than in pilot firms.

Average claim costs increased for Kaiser FFS care between the pre and post 24-hour study period. Thus, the cost advantage within pilot firms, particularly among Kaiser FFS claims, relative to control firms, was substantially reduced by the end of 1997.

C. The 24-hour pilot programs produced *lower* claims costs (4.7 to 6.5%) for temporary and permanent disability cases, but *higher* claims costs (20 to 34%) for medical only claims.

For temporary and permanent disability claims, KOJ claims were *less* expensive than both Kaiser FFS (by 6.5 and 4.7%, respectively) and non-Kaiser claims within the pilot firms, and *less* expensive than claims within control firms. None of these differences was statistically significant, however. For medical only claims, KOJ claims were substantially *more* expensive than both Kaiser FFS and non-Kaiser claims within pilot firms. All of these differences were significant at the .05 level. Because the vast majority of claims involved medical only payments (82.3%), our findings suggest that KOJ claims in general were more expensive controlling for all other factors. For the two largest categories of medical only claims, KOJ claims were 20 to 34% more expensive than Kaiser FFS claims within pilot firms.

D. Overall, pilot firms paid 47.5% *more* in total KOJ premiums than if they had paid for KOJ claim on a FFS basis.

DATA SOURCES

The data used for this part of the evaluation were obtained from Kaiser and the State Compensation Insurance Fund (SCIF), one of the largest workers' compensation insurers in California. We received claims and disability payment data from SCIF for pilot firms and control firms, covering the period from 1990 to 1998.

SCIF claims data contained most of the information needed for the evaluation, but it lacked several crucial data elements. First, because of the nature of the demonstration project (i.e., capitated medical payments for individuals enrolled in KOJ), SCIF data did not contain payment information for KOJ enrollees. For KOJ claims, therefore, we imputed costs using "shadow" bill data provided by Kaiser. These shadow bills included services provided to KOJ injured workers defined according to Current Procedural Terminology (CPT) codes. We imputed costs by using the Official Medical Fee Schedule used by DWC to establish fee-for-service payments under workers' compensation. The second important piece of information missing from the SCIF data was membership in Kaiser. Thus, we obtained membership data directly from Kaiser. Third, SCIF lacked data on 5 self-insured firms who participated in KOJ, so we obtained shadow bill data from Kaiser for those firms. Kaiser data also provided us with additional information about the diagnostic and procedure codes for Kaiser enrollees, since these data are not collected by SCIF.

Because there was such limited enrollment in Maxicare, we did not attempt to obtain their 24-hour claims data.

CREATING A KAISER ANALYSIS FILE

Kaiser data came to us in three files: membership, claims, and services. As the names suggest, the membership data contained the individual members' name, date of birth, gender, date of enrollment in the KOJ pilot, date of disenrollment from the pilot, and the name of the employer. The claims data were for KOJ claims only, and contained the date of injury and the diagnosis on the specific claim. The service data contained a description of services provided with associated payment amounts based on the Official Medical Fee Schedule. Our primary data management task consisted of creating a single file, which contained membership, claim, and service data.

A number of inconsistencies existed in the data. First, the quality of the data varied greatly between the Northern and Southern California Kaiser, due to a different system of data collection and maintenance in each location. For example, the Southern California data, unlike Northern California, contained a unique identifier for each claim allowing a fast and efficient identification of all data related to a claim. On the other hand, Southern California contained many records without amounts associated with them, which later were found to be case management services.

There were also a number of records in Southern California data without membership and services information. We later determined that these records were included in the data by mistake. Other data quality issues included missing data on the date of injury in claims data and not services data (creating difficulties in matching services to specific claims, we assigned a date of injury to those claims based on

the first date of service), existing continuous claims that were taken on by SCIF and Kaiser without any additional services performed (these did not have any services associated with them, but usually inflated the claim rate in the pre-pilot period), inconsistent diagnosis codes between the North and the South, and missing claims identification numbers.

We identified the following categories of data when we attempted to create a complete file: (1) records with membership, claims, and service data, (2) records with membership and claims data only, (3) records with membership and service data only, (4) records with claims and service data only, (5) records with only service data. The only records with sufficient information for inclusion in our claims analysis were those in categories 1 and 3. Records in category 3 were limited to cost analysis as opposed to cost and diagnosis analysis possible for records in category 1. We could not use records in categories 4 and 5 because we could not identify whether the claim occurred when the person was enrolled in the KOJ pilot. Records in category 2 were found to be case management services and were excluded from further analysis (Northern California data did not include case management services, and even though Southern California data had a listing of these services, no amounts were associated with them).

Our final Kaiser analysis file included 2,105 claims from categories 1 and 3 above, of which 1,297 were KOJ claims. Of these 1,297 KOJ claims, 1,053 (81.2%) were from 5 self-insured employers, including Kaiser as an employer. These claims could not be included in most of the analyses reported in this Section because they lacked sufficient information about the nature of injury, body part injured, etc. to be comparable to the claims we received from SCIF (described below). Nevertheless, these claims were useful for benchmarking the KOJ claims from SCIF-insured firms. The remaining 244 KOJ claims were from firms insured by SCIF. These SCIF-insured claims obtained from Kaiser were later matched with claims obtained from SCIF, as described below, and were used in the detailed analyses presented throughout this Section.

CREATING A SCIF ANALYSIS FILE

We received data from SCIF for 101 control firms and 58 24-hour pilot firms. A total of 16,103 claims occurred between 1992-1997. We excluded data from 1990-1991 because of data quality issues, and excluded claims during 1998 because too few were closed. Of these total records, 11,472 (71%) were from pilot employers, and 4,631 (29%) were from controls. This disparity in the number of claims is mostly attributable to fact that we were unable to identify suitable controls for some of the largest firms in the pilot program. Despite this discrepancy in number of claims between control and pilot firms, our analyses presented below suggest that the distribution of claims in the two groups was quite similar.

SCIF data contained detailed information on the date of birth, gender, employer, employer's enrollment and disenrollment dates in the KOJ pilot, date of injury, claim status, type of payment, total paid medical and compensation amounts, the nature of accident, the nature of injury, and the part of body injured.

Approximately 5000 (31%) claims in SCIF data lacked payment information or had payments below \$5.00. This could happen for several reasons, for example when the employer paid out of pocket for services but reported the injury, no services were required for a reported injury, or the employee did

not seek treatment for an injury. These records were excluded from our analysis. Of the remaining 11,102 claims with payments, 9,566 were closed by December 1997, when the pilot officially ended, and 1,536 were still open.

We excluded open claims from our analysis in this Section because we were primarily interested in the impact of 24-hour coverage on costs, and open claims tend to bias cost estimates downward. However, by focusing on closed claims only, we were limited in our ability to draw firm conclusions about changes over time in the distribution of claims.

CREATING A COMBINED SCIF AND KAISER ANALYSIS FILE

An integral part of file construction involved identifying claims in the SCIF data that occurred during an injured workers' enrollment in KOJ. This task required matching records from SCIF to those from Kaiser, and was complicated by the lack of a common identifier between the two datasets and multiple claims for some individuals. For those with multiple claims, we matched by the year of injury. For those with multiple injuries in one year, we used the last injury within the year. We used social security number, name, date of birth, date of injury, and the gender of the person in this match.

Of the 308 Kaiser claims identified in SCIF-insured pilot firms, 35 claims had missing data on date of injury, and thus could not be successfully merged with SCIF data. This resulted in a total of 273 successfully merged KOJ claims. For the final analysis, we excluded claims without payments or those below \$5.00 as well as claims that were still open. These exclusions further eliminated 29 KOJ claims, leaving us with a final total of 244 KOJ claims for the cost analysis.

CREATION OF ANALYSIS VARIABLES

The claims in the final analysis file were classified into several comparison groups based on whether they were from the control or pilot firms, when they occurred, and where was treatment received. In some pilot firms, injured non-KOJ employees may have also received their care at Kaiser if the employer used Kaiser for their workers' compensation care. This provided a unique opportunity to compare the cost of claims for non-KOJ Kaiser care with KOJ care within these pilot firms. Control firms were matched to pilot firms based on firm size, location, and major industry code. In several cases, we had more than one control firm matched to a pilot firm, and for some of the large pilot firms, we were unable to find adequate matches based on firm size. The claims from 1992-1997 were divided into three time periods corresponding to when each pilot firm participated in the pilot program: pre, during, and post. Because the control firms did not participate in the pilot program, we determined their time periods based on the pilot firm to which they were matched. For example, if a control firm was matched to pilot firm that joined the pilot program from July 1, 1996 until June 30, 1997, we used those dates to determine the pre, during, and post periods for the control firm. Table 2.1 depicts the classification of all the claims in the final analysis file.

Table 2.1. Number of Closed Medical Claims Used in Final Claims Analysis File, by Time Period, Firm Status, and Insurance Status.

	Control	Pilot		Total	
		Kaiser			
		KOJ	Non KOJ		
Pre	1,881	-	1,207	2,850	5,938
During	955	244	547	1,244	2,990
Post	290	-	136	212	638
Total	3,126	244	1,890	4,306	9,566

For two-thirds (66%) of KOJ enrollees, SCIF did not pay any medical costs and Kaiser provided all medical care. However, there were many cases (34%) where SCIF paid for some medical services in addition to Kaiser. These payments were made if the person went to Kaiser for the initial 1-2 visits, but the case was litigated and the person went to other providers. Other SCIF payments were for services that Kaiser did not provide, such as transportation to and from medical offices and ergonomic evaluation.

To test the effect of claims with long tails on the total costs, we calculated the length of time services were provided for each claim by identifying the dates when the services began and ended. For KOJ participants, we calculated the length of service by identifying the beginning and last date of service from Kaiser data. Further investigation of the relationship between costs and the length of the claim indicated a curvilinear relationship, with costs leveling off for particularly long claims.

Other analysis variables included nature of injury, body part, location of the firm in the Northern or Southern California regions, and age and gender of the injured.

ANALYSES

Our analyses can be grouped into five categories. First, we examined the distribution and general trends in the type of claims from 1992-1997, such as nature of accident and injury or body part injured. These analyses focused primarily on temporal trends and differences by type of firm without comparing pilot and controls directly. The purpose of these analyses was to allow us to evaluate how representative our claims data were of overall workers' compensation claims in the state of California. In the second set of analyses, we specifically examined the distribution and trends in claims comparing pilot and control firms, to determine if the pilots and control firms had comparable claims. The third set of analyses focused on average medical costs. The fourth set focused on claims from the self-employed firms, which could not be analyzed with the other claims, but which provided information about the distribution of diagnoses. Finally, the fifth set of analyses used multivariate regression to isolate the effects of capitation under KOJ, controlling for other potential confounding factors, such as differences in the types of injuries, length of claim, etc.

A. DISTRIBUTION OF WORKERS' COMPENSATION CASES: 1992-1997

The tables presented below illustrate a fundamental problem in conducting an economic evaluation of claims data where claims can remain open for years. Using open claims would provide a more precise

estimate of injury rates, but complicates the analysis of claims costs. Open claims represent truncated observations that bias our estimated costs downward. However, by reporting only closed claims, the descriptive statistics reported above do not reflect the true change in the composition of claims during the 1992-1997 period. Our multivariate analyses, reported at the end of this Section, do control for the impact of changes in the distribution of claims on costs, regardless of the source of that change. Therefore, the descriptive results presented below should not be interpreted as representative of the true change in composition of claims during the 1992-1997 period. Rather, these results should be interpreted cautiously, particularly because the portion of open claims for some injuries was rather high for several conditions during 1996 and 1997. The primary purpose of these descriptive tables is to evaluate the overall validity of our claims data with general trends reported in the state.

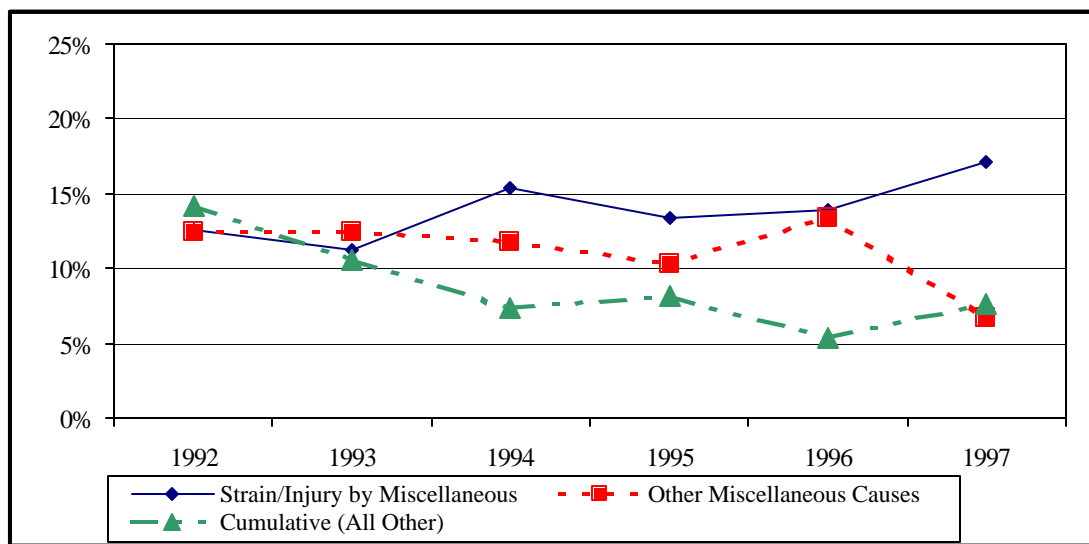
There appeared to be a shift in the composition of the top three reported accidents in the study years. For example, the proportion of accidents classified as strain or injury by miscellaneous causes increased from 13% to 17% of the closed cases from 1992 to 1997 (Table 2.2). The graph in Exhibit 2.1 demonstrates that despite the overall increase from 1992 to 1997, strain/injury accident reports continually fluctuated from year to year. The second most commonly reported accident, other miscellaneous causes varied little from 1992 to 1996 with a sudden downward surge (13% to 7%) from 1996 to 1997. The proportion of accidents classified as cumulative from all sources decreased steadily from 1992-1994, the years before the implementation of the pilots, but remained relatively steady during the implementation of the pilot projects. Other accidents, such as repetitive motion show a sudden surge in 1993, but a slow downward trend thereafter, resulting in a net increase of 3% points overall, from 3% in 1992 to 6% in 1997. Accidents caused by exposure to dust, gas, or vapors had a sharp increase in 1995, while remaining relatively stable in the other years.

The distribution of daims by nature of accident reported for the entire state of California in 1994 was very similar to the distribution of claims in our analysis file. We chose 1994 as the comparison year because it was the first year of the pilot programs and had the highest rate of closed claims in our analysis file during the pilot period. Statewide, strains/injury accounted for about 25% of claims, other cumulative about 7%, repetitive motion about 4%, fall on same level about 4%, and pushing or pulling strain about 4%. Except for repetitive motion claims, which were considerably higher in our analysis file, perhaps due to the relatively high proportion of office workers in our pilot firms, we conclude that our claims were representative of statewide claims with respect to the nature of accident.

Table 2.2. Closed Claims by Nature of Accident, by Year.

Nature of Accident	1992	1993	1994	1995	1996	1997
Strain/Injury by Miscellaneous	13%	11%	15%	13%	14%	17%
Other Miscellaneous Causes	12%	12%	12%	10%	13%	7%
Cumulative (All Other)	14%	11%	7%	8%	5%	8%
Strain/Injury by Lifting	9%	9%	9%	8%	9%	8%
Repetitive Motion	3%	8%	8%	7%	6%	6%
Fall/Slip on Miscellaneous	3%	3%	7%	5%	4%	8%
Fall/Slip on Same Level	6%	6%	4%	4%	4%	3%
Cut/Injured by Miscellaneous	3%	1%	3%	4%	5%	4%
Injury by Pushing/Pulling	4%	4%	3%	3%	3%	2%
Exposure to Dust/Gas/Vapor	1%	1%	3%	6%	2%	1%
All Other	32%	33%	30%	32%	35%	36%
Total Percent	100%	100%	100%	100%	100%	100%
Total Number	1,612	1,788	1,609	1,767	1,579	1,211

Exhibit 2.1. Changes in Top Three Accidents, Closed Claims 1992-1997.



The observed trends in types of accidents can be attributed to a number of changes such as a higher rate of classification of claims under strain and injury or to changes in proportion of people in jobs with higher or lower types of certain accidents. The primary explanation is that in the later years fewer claims were closed. As is apparent in Table 2.3, fewer claims were closed in 1997 than in 1992 for all types of accidents, but the proportions closed for certain accidents were much smaller. Among the top three types of accidents, fewer cumulative accidents were closed over time than the other top two types of accidents.

Table 2.3. Rate of Claims Closed by Nature of Accident and Year.

	1992	1993	1994	1995	1996	1997
Strain/Injury by Miscellaneous	95%	97%	90%	85%	80%	69%
Other Miscellaneous Causes	93%	91%	87%	83%	80%	61%
Cumulative (All Other)	92%	90%	87%	76%	59%	51%
Strain/Injury by Lifting	93%	92%	93%	87%	83%	72%
Repetitive Motion	92%	91%	80%	75%	61%	41%
Fall/Slip on Miscellaneous	96%	91%	92%	90%	68%	74%
Fall/Slip on Same Level	95%	94%	89%	88%	86%	77%
Cut/Injured by Miscellaneous	100%	100%	100%	98%	100%	96%
Injury by Pushing/Pulling	95%	98%	98%	92%	82%	79%
Exposure to Dust/Gas/Vapor	100%	100%	100%	94%	100%	71%
All Other	96%	94%	93%	93%	89%	84%
Percent of total claims closed	95%	93%	91%	87%	81%	70%

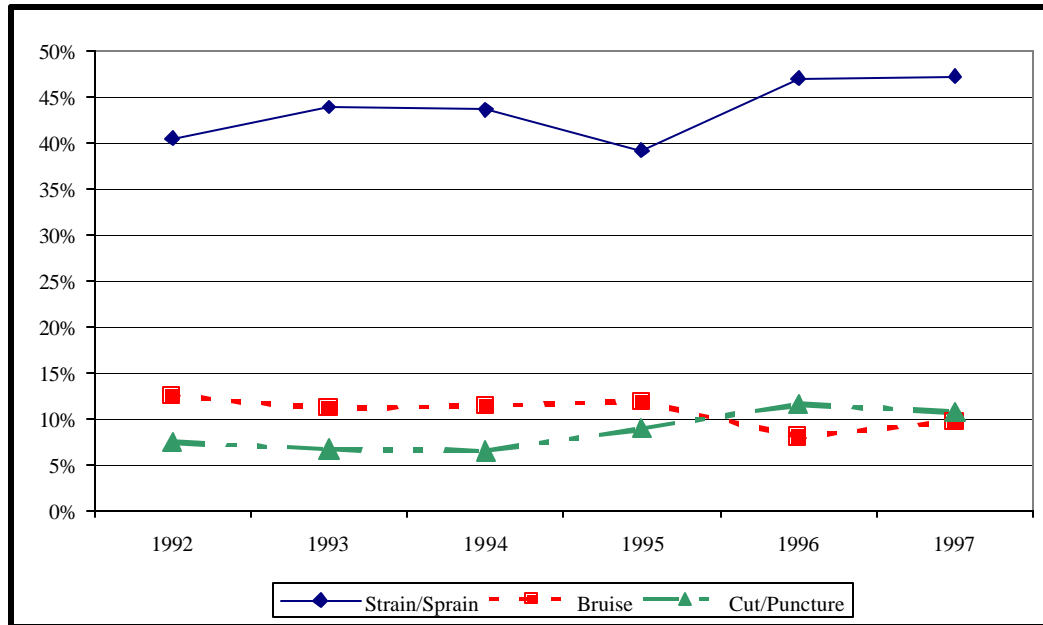
The nature of injury also changed considerably during the period from 1992-1997 (Table 2.4, Exhibit 2.2). There was a large and steady increase (40% to 47%) in strains and sprains, with an unexplained drop (39%) in 1995. Bruises comprised about 10% of the injuries, with the trend persisting throughout the study period. Cuts and punctures appeared to increase slightly over time, starting out at 7% in 1992, and increasing to about 11% in 1997.

Table 2.4. Closed Claims by Nature of Injury and Year.

	1992	1993	1994	1995	1996	1997
Strain/Sprain	40%	44%	44%	39%	47%	47%
Bruise	12%	11%	11%	12%	8%	10%
Cut/Puncture	7%	7%	6%	9%	12%	11%
Not Described	10%	6%	8%	9%	9%	5%
Stress- Job	9%	9%	6%	6%	5%	9%
Irritant	5%	4%	6%	7%	5%	6%
Multiple Injuries	4%	3%	4%	4%	4%	4%
Carpal Tunnel Syndrome	2%	4%	3%	3%	1%	0%
Cumulative Injury	3%	2%	2%	2%	2%	1%
Illness	0%	1%	2%	1%	2%	2%
All Other	7%	9%	7%	7%	7%	5%
Total Percent	100%	100%	100%	100%	100%	100%
Total Number	1,612	1,788	1,609	1,767	1,579	1,211

The distribution of claims by nature of injury reported for the entire state of California in 1994 was very similar to the distribution of claims in our analysis file. Statewide, strain/sprain accounted for about 48% of claims, bruises about 8%, cut/puncture about 4%, carpal tunnel syndrome about 3%, and stress about 2%. Except for stress claims, which were considerably higher in our analysis file, again probably due to the higher portion of office workers in our pilot firms, we conclude that our claims were representative of statewide claims with respect to the nature of injury.

Exhibit 2.2. Changes in Top Three Injuries, Closed Claims, 1992-1997.



Despite the high frequency of strains/sprains, it appears that the portion of these cases may be understated given the larger portion of these cases that were still open in later years (Table 2.5). The portion of cuts and punctures increased slightly over time, but this may have been due to the lower portion of closed cases for other conditions relative to cuts and punctures. The decrease for carpal tunnel syndrome may be explained by the potentially long recovery period of the injury. Carpal tunnel syndrome claims were far less likely to be closed in the later years, with only 7% closed in 1997, and thus are unlikely to truly have decreased as suggested by Table 2.4.

Table 2.5. Rate of Claims Closed by Nature of Injury and Year.

	1992	1993	1994	1995	1996	1997
Strain/Sprain	94%	93%	91%	87%	78%	68%
Bruise	98%	96%	93%	93%	85%	87%
Cut/Puncture	99%	100%	98%	99%	99%	94%
Not Described	94%	88%	85%	78%	74%	53%
Stress- Job	94%	93%	89%	83%	74%	67%
Irritant	100%	100%	97%	95%	100%	94%
Multiple Injuries	89%	86%	80%	90%	86%	73%
Carpal Tunnel Syndrome	94%	84%	81%	66%	48%	7%
Cumulative Injury	81%	82%	83%	73%	53%	24%
Illness	100%	100%	97%	90%	93%	75%
All Other	99%	98%	94%	94%	89%	73%
Percent of total claims closed	95%	93%	91%	87%	81%	70%

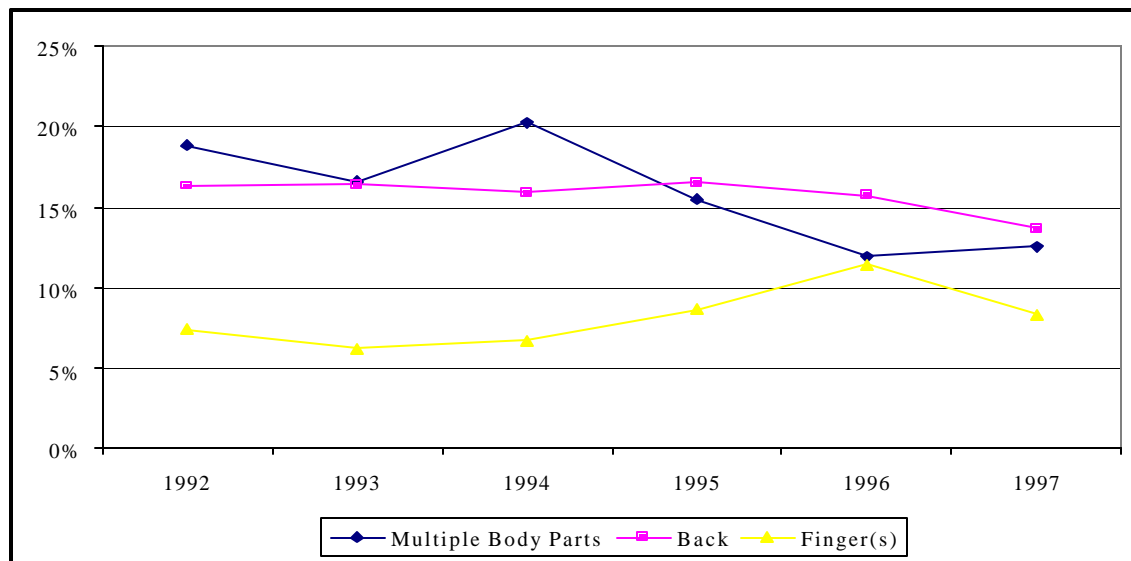
Changes in the distribution of claims by site of injury or body part were less pronounced overall (Exhibit 2.3). Claims for injuries to multiple body parts showed a relatively stable decrease, particularly from 1995 to 1997 (Table 2.6). In contrast, back and finger injuries appeared to represent a relatively constant proportion of the closed claims during the years of the study period.

Table 2.6. Closed Claims by Part of Body and Year.

	1992	1993	1994	1995	1996	1997
Multiple Body Parts	19%	17%	20%	16%	12%	13%
Back	16%	16%	16%	17%	16%	14%
Finger(s)	7%	6%	7%	9%	11%	8%
Wrist	9%	9%	8%	8%	8%	7%
Psyche	8%	8%	6%	6%	4%	9%
Hand(s)	5%	6%	6%	5%	6%	6%
Knee	5%	5%	5%	4%	4%	6%
Arm(s)	4%	5%	4%	5%	6%	6%
Eye(s)	4%	3%	3%	3%	4%	6%
Shoulder	3%	4%	3%	4%	4%	4%
All Other	21%	22%	22%	24%	26%	23%
Total Percent	100%	100%	100%	100%	100%	100%
Total Number	1,612	1,788	1,609	1,767	1,579	1,211

The distribution of claims by part of body reported for the entire state of California in 1994 was very similar to the distribution of claims in our analysis file. Statewide, multiple body parts accounted for about 19% of claims, back about 16%, knee about 8%, wrist about 7%, and finger about 5%. The higher portion of finger injuries and lower portion of knee injuries again may be indicative of the high portion of office workers among our pilot firms. In general, our claims were representative of statewide claims with respect to body part injured.

Exhibit 2.3. Changes in the Top Three Injured Body Parts, Closed Claims, 1992-1997.



The larger portion of open cases in later years may reduce the validity of the above assumptions (Table 2.7). The portion of closed claims for multiple body parts decreased from 91% in 1992 to only 63% in 1997. Similarly, the portion of closed claims for back injuries decreased from 94% in 1992 to only 69% in 1997. For knee injuries, however, a significant decrease in proportion of the closed claims was observed, from 99% in 1992 to 17% in 1997, even though the frequency of knee injuries appeared to be flat. This dramatic decrease in closed claims suggests that the trend in these claims actually increased, rather than remaining constant as suggested by Table 2.6.

Table 2.7. Rate of Claims Closed by Part of Body and Year.

	1992	1993	1994	1995	1996	1997
Multiple Body Parts	91%	88%	87%	83%	75%	63%
Back	94%	93%	92%	86%	79%	69%
Finger(s)	98%	97%	99%	96%	95%	90%
Wrist	92%	91%	84%	79%	78%	62%
Psyche	92%	93%	90%	86%	69%	64%
Hand(s)	94%	95%	90%	85%	73%	60%
Knee	99%	99%	84%	87%	74%	71%
Arm(s)	93%	95%	88%	83%	77%	64%
Eye(s)	100%	100%	100%	100%	100%	99%
Shoulder	92%	91%	90%	86%	91%	63%
All Other	99%	95%	93%	92%	86%	76%
Percent of total claims closed	95%	93%	91%	87%	81%	70%

Overall, the distributions presented above suggest that our claims data were representative of statewide claims with respect to nature of accident, nature of injury, and body part injured.

B. DISTRIBUTION OF CLAIMS BY FIRM STATUS

The distribution of claims was strongly associated with firm characteristics. Distinct differences existed in the proportion of several reported accidents by geographic location of the firm. Accidents classified as strain/injury occurred more frequently in the South (21%) than the North (12%) (Table 2.8). Accidents from other miscellaneous causes represented about 14% of claims in the South, but only 11% in the North. On the other hand, far more accidents were classified as cumulative in the North (10%) than the South (2%). For some of the less frequent accidents, such as repetitive motion and exposure to dust/gas/vapor, a larger proportion occurred in the North than in the South.

Table 2.8. Closed Claims by Nature of Accident, Location and Public/Private Status.

	Location		Public/Private Status	
	North	South	Public	Private
Strain/Injury by Miscellaneous	12%	21%	13%	16%
Other Miscellaneous Causes	11%	14%	13%	8%
Cumulative (All Other)	10%	2%	12%	1%
Strain/Injury by Lifting	9%	8%	7%	11%
Repetitive Motion	7%	2%	9%	1%
Fall/Slip on Miscellaneous	5%	4%	5%	4%
Fall/Slip on Same Level	5%	2%	5%	3%
Cut/Injured by Miscellaneous	3%	4%	2%	6%
Injury by Pushing/Pulling	3%	2%	3%	3%
Exposure to Dust/Gas/Vapor	3%	0%	3%	1%
All Other	31%	42%	27%	46%
Total Percent	100%	100%	100%	100%
Total Number	8,032	1,534	6,574	2,992

The differences in types of accident by region may be due to the prevalence of firms with certain types of claim experience in each region. For example, the incidence of miscellaneous strains and injuries may

be higher in labor-intensive businesses such as meatpacking or courier services that are concentrated in the South or are more often private. These differences may also be attributable to the number of open cases in each region, since in most accident classifications, a higher proportion of claims in the North were still open (Table 2.9).

Table 2.9. Rate of Claims Closed by Nature of Accident, Location, and Public/Private Status.

	Location		Public/Private Status	
	North	South	Public	Private
Strain/Injury by Miscellaneous	83%	92%	82%	89%
Other Miscellaneous Causes	82%	94%	82%	91%
Cumulative (All Other)	77%	83%	77%	78%
Strain/Injury by Lifting	86%	94%	84%	93%
Repetitive Motion	70%	83%	70%	73%
Fall/Slip on Miscellaneous	82%	96%	81%	91%
Fall/Slip on Same Level	90%	92%	88%	97%
Cut/Injured by Miscellaneous	99%	98%	98%	99%
Injury by Pushing/Pulling	91%	100%	89%	98%
Exposure to Dust/Gas/Vapor	95%	100%	95%	100%
All Other	91%	97%	89%	96%
Percent of total claims closed	85%	95%	83%	94%

Firms in Southern California consistently had a higher portion of closed claims compared to Northern California (Table 2.9). Eighty-three percent of the strain injuries in the North were closed, while 92% of the strain injuries were closed in the South. Eighty-two percent of the accidents in the North caused by other miscellaneous causes were closed, while 94% of these accidents were closed claims in the South. For the cumulative injuries, 77% of the claims were closed in Northern California, and 83% of the claims were closed in Southern California. In general, the rate of closed claims was higher in private firms relative to public firms for every nature of injury category.

Table 2.10. Closed Claims by Nature of Injury, Location and Public/Private Status.

	Location		Public/Private Status	
	North	South	Public	Private
Strain/Sprain	43%	47%	43%	43%
Bruise	10%	12%	10%	12%
Cut/Puncture	8%	11%	5%	16%
Not Described	9%	1%	9%	5%
Stress- Job	9%	1%	11%	0%
Irritant	5%	7%	5%	6%
Multiple Injuries	4%	5%	3%	5%
Carpal Tunnel Syndrome	3%	0%	3%	0%
Cumulative Injury	2%	1%	2%	1%
Illness	1%	0%	2%	0%
All Other	6%	15%	6%	10%
Total Percent	100%	100%	100%	100%
Total Number	8,032	1,534	6,574	2,992

Geographic differences in the top three injuries, strain/sprain, bruise, and cut/puncture existed but were small (Table 2.10). Firms in the South had a slightly larger percentage of these injuries (2%-3%).

Similarly, undescribed injuries and job stress occurred mostly in Northern California firms. Unlike geographic differences, strain/sprain injuries did not differ by public/private status, but more cut/punctures occurred in private firms (16% vs. 5%) than public ones. The most significant difference in frequency of injuries between public and private firms occurred for stress-related injuries. More public firms claims (11%) were stress-related, as opposed to 0% of claims from private firms.

Table 2.11. Rate of Claims Closed by Nature of Injury, Location, and Public/Private Status.

	Location		Public/Private Status	
	North	South	Public	Private
Strain/Sprain	83%	93%	82%	91%
Bruise	91%	98%	90%	98%
Cut/Puncture	98%	99%	97%	99%
Not Described	79%	94%	77%	91%
Stress- Job	83%	80%	83%	75%
Irritant	97%	98%	96%	99%
Multiple Injuries	83%	91%	80%	92%
Carpal Tunnel Syndrome	70%	50%	71%	36%
Cumulative Injury	64%	88%	64%	78%
Illness	90%	100%	90%	100%
All Other	91%	96%	91%	94%
Percent of total claims closed	85%	95%	83%	94%

Comparison of rate of closed claims by geographic region revealed that fewer claims in the North were closed for the top two injuries (Table 2.11). Cuts/punctures had equal proportions of closed claims in both locations. The top three injuries were also more frequently closed in firms with public ownership. Despite the fact that stress injuries were significantly more frequent in public firms, the difference in the proportion of these claims that were closed was not significant between private and public firms.

Table 2.12. Closed Claims by Part of Body, Location, and Public/Private Status.

	Location		Public/Private Status	
	North	South	Public	Private
Multiple Body Parts	17%	12%	18%	13%
Back	15%	18%	15%	18%
Finger(s)	8%	9%	6%	13%
Wrist	8%	6%	9%	5%
Psyche	8%	1%	10%	0%
Hand(s)	6%	5%	5%	6%
Knee	5%	6%	5%	5%
Arm(s)	5%	6%	5%	5%
Eye(s)	3%	6%	2%	7%
Shoulder	3%	4%	4%	3%
All Other	22%	26%	23%	23%
Total Percent	100%	100%	100%	100%
Total Number	8,032	1,534	6,574	2,992

Claims with injuries to multiple body parts occurred more frequently in the North (17%) than the South (12%) (Table 2.12). Back injuries were slightly more common in the South. The most significant differences in frequency of claims were for injuries to the psyche, where significantly more claims in the

North had were reported (8%) than the South (1%). Injuries to multiple body parts were also more frequent among public firms (18%) than private ones (13%), but back injuries were more frequent among private firms. Again, the most significant difference was for injuries of the psyche (i.e., stress injuries). Ten percent of claims in public firms were injuries to psyche, while none were identified for private firms, consistent with the findings in Table 2.10.

Table 2.13. Rate of Claims Closed by Part of Body, Location, and Public/Private Status.

	Location		Public/Private Status	
	North	South	Public	Private
Multiple Body Parts	82%	89%	81%	88%
Back	85%	93%	84%	91%
Finger(s)	95%	99%	80%	89%
Wrist	80%	93%	93%	99%
Psyche	82%	83%	83%	75%
Hand(s)	79%	96%	75%	96%
Knee	84%	90%	84%	86%
Arm(s)	79%	100%	76%	97%
Eye(s)	100%	99%	100%	100%
Shoulder	79%	94%	78%	91%
All Other	89%	97%	87%	97%
Percent of total claims closed	85%	95%	83%	94%

More claims were closed in the North than the South for the top three body parts injured (Table 2.13). For example, fewer multiple body parts claims were closed in the North (82%) than the South (89%). This trend was reflective of the general trend in percentage of claims closed by geographic location. Yet, the more common back injuries in the South seemed to be of shorter duration since a larger percentage of cases were closed within the study period. So the geographic differences in frequency of closed claims may have been more a reflection of the duration of the claim or differences in rates of litigation. Similarly, more public firm claims were closed for the most common injuries to body parts, differences that may have been due to factors other than incidence of such injuries.

Comparison of Claims by Study Period and Pilot Status of Firms

In this section, we highlight differences in the distribution of claims by study period (i.e., pre, during, and post implementation of 24-hour coverage) and by the status of the firms (pilot versus control). We also separate capitated Kaiser (i.e., KOJ) versus non-capitated Kaiser claims within the pilot firms.

Accidents classified as strain/injury occurred as frequently among capitated cases (KOJ) (14%) as non-capitated cases in pilot (non-KOJ) (15%) or control (14%) firms (Table 2.14). The second most frequent type of accident, other miscellaneous causes, was slightly more frequent among capitated cases (10%) than non-capitated cases in control firms (7%), but about the same among non-capitated cases in pilot firms. The most significant differences in claims was identified for accidents classified as repetitive motion. More such claims occurred among capitated cases (10%) than among both non-capitated pilot cases (5%) and control cases (6%).

Table 2.14. Portion of Closed Claims by Nature of Accident, Enrollment Period, and Pilot Status.

	Control Firms			Pilot Firms			
	Pre	During	Post	Pre	During (KOJ)	During (Non-KOJ)	Post
Strain/Injury by Miscellaneous	11%	14%	12%	13%	14%	15%	22%
Other Miscellaneous Causes	13%	7%	7%	12%	10%	11%	9%
Cumulative (All Other)	13%	6%	5%	10%	6%	6%	7%
Strain/Injury by Lifting	12%	10%	9%	8%	9%	7%	5%
Repetitive Motion	5%	6%	2%	8%	10%	5%	5%
Fall/Slip on Miscellaneous	5%	6%	7%	5%	7%	5%	9%
Fall/Slip on Same Level	6%	2%	1%	5%	3%	4%	3%
Cut/Injured by Miscellaneous	3%	6%	9%	2%	2%	4%	3%
Injury by Pushing/Pulling	4%	3%	3%	3%	1%	2%	2%
Exposure to Dust/Gas/Vapor	1%	1%	1%	3%	2%	5%	2%
Other	28%	41%	43%	30%	36%	37%	32%
Total Percent	100%	100%	100%	100%	100%	100%	100%
Total Number	1,881	955	290	4,057	244	1,791	348

Table 2.15. Rate of Claims Closed by Nature of Accident, Enrollment Period, and Pilot Status.

	Control Firms			Pilot Firms			
	Pre	During	Post	Pre	During (KOJ)	During (Non-KOJ)	Post
Strain/Injury by Miscellaneous	91%	78%	73%	92%	89%	77%	72%
Other Miscellaneous Causes	90%	80%	68%	88%	89%	79%	56%
Cumulative (All Other)	87%	64%	47%	88%	93%	55%	47%
Strain/Injury by Lifting	94%	78%	74%	90%	88%	83%	73%
Repetitive Motion	84%	59%	37%	83%	77%	54%	37%
Fall/Slip on Miscellaneous	96%	77%	83%	88%	85%	78%	67%
Fall/Slip on Same Level	97%	70%	67%	92%	100%	85%	67%
Cut/Injured by Miscellaneous	100%	100%	100%	100%	100%	99%	100%
Injury by Pushing/Pulling	97%	77%	82%	95%	75%	86%	89%
Exposure to Dust/Gas/Vapor	100%	100%	75%	98%	100%	96%	64%
Other	94%	92%	92%	94%	99%	89%	79%
Percentage of total claims closed	92%	81%	77%	91%	91%	79%	66%

The larger proportion of closed claims for capitated cases than the other two groups seemed to indicate that if all claims were included, the above-mentioned differences were likely to be greater (Table 2.15). The closure rate for KOJ strain/injury accidents was 89% but 77% for the remaining pilot claims and 78% for control group claims during the pilot project period. The closure rates for all other cumulative accidents and repetitive motion accidents were also higher for KOJ claims than for the other two non-capitated groups.

Table 2.16. Closed Claims by Nature of Injury, Enrollment Period, and Pilot Status.

	Control Firms			Pilot Firms			
	Pre	During	Post	Pre	During (KOJ)	During (Non-KOJ)	Post
Strain/Sprain	43%	43%	36%	43%	49%	45%	49%
Bruise	12%	11%	9%	12%	9%	9%	8%
Cut/Puncture	8%	13%	20%	7%	7%	8%	9%
Not Described	11%	4%	4%	8%	9%	7%	7%
Stress- Job	9%	6%	7%	8%	2%	5%	9%
Irritant	5%	8%	9%	5%	5%	6%	6%
Multiple Injuries	4%	4%	6%	4%	6%	3%	4%
Carpal Tunnel Syndrome	3%	1%	0%	4%	1%	1%	0%
Cumulative Injury	2%	1%	1%	2%	4%	2%	1%
Illness	1%	1%	2%	1%	1%	2%	3%
All Other	3%	7%	7%	7%	7%	12%	4%
Total Percent	100%	100%	100%	100%	100%	100%	100%
Total Number	1,881	955	290	4,057	244	1,791	348

The only important difference between capitated and non-capitated claims within pilot firms was for stress injuries, with fewer claims among capitated cases (2% versus 5%) (Table 2.16). Similarly, stress injuries occurred less often among capitated claims (2%) than among control firm claims (6%). Bruise injuries were as frequent among capitated cases (9%) and other non-capitated pilot claims (9%), but less than cases in control firms (11%). The same relationships existed for cut/puncture injuries.

Table 2.17. Rate of Claims Closed by Nature of Injury, Enrollment Period, and Pilot Status.

	Control Firms			Pilot Firms			
	Pre	During	Post	Pre	During (KOJ)	During (Non-KOJ)	Post
Strain/Sprain	93%	76%	70%	90%	88%	78%	66%
Bruise	96%	89%	87%	95%	96%	86%	88%
Cut/Puncture	99%	99%	95%	99%	100%	98%	88%
Not Described	91%	69%	80%	83%	100%	67%	50%
Stress- Job	87%	72%	63%	92%	86%	77%	60%
Irritant	100%	100%	100%	98%	100%	94%	85%
Multiple Injuries	82%	91%	74%	87%	100%	82%	67%
Carpal Tunnel Syndrome	83%	56%	0%	81%	50%	32%	0%
Cumulative Injury	87%	48%	29%	79%	90%	45%	38%
Illness	90%	71%	75%	94%	100%	91%	91%
All Other	96%	90%	80%	97%	100%	87%	62%
Percentage of total claims closed	92%	81%	77%	91%	91%	79%	66%

The rate of closed claims was higher among KOJ cases than the non-capitated claims most injury categories (Table 2.17). This suggests that KOJ was effective in bringing cases to closure more rapidly relative to both non-capitated Kaiser cases and control cases.

Table 2.18. Closed Claims by Part of Body, by Enrollment Period and Pilot Status.

	Control Firms			Pilot Firms		During (Non-KOJ)	Post
	Pre	During	Post	Pre	During (KOJ)		
Multiple Body Parts	17%	10%	10%	19%	12%	14%	14%
Back	18%	17%	12%	16%	18%	14%	13%
Finger(s)	8%	12%	14%	6%	8%	9%	6%
Wrist	9%	6%	8%	9%	11%	7%	7%
Psyche	8%	6%	6%	7%	2%	4%	9%
Hand(s)	6%	6%	7%	6%	3%	6%	5%
Knee	5%	5%	4%	5%	5%	5%	8%
Arm(s)	3%	5%	5%	5%	9%	5%	5%
Eye(s)	4%	6%	10%	3%	4%	3%	4%
Shoulder	3%	3%	2%	4%	7%	4%	3%
All Other	17%	24%	20%	22%	20%	30%	26%
Total Percent	100%	100%	100%	100%	100%	100%	100%
Total Number	1,881	955	290	4,057	244	1,791	348

Claims for finger injuries were slightly less common among the capitated claims (8%), compared to control claims (12%), but similar to non-capitated pilot claims (9%) (Table 2.18). This same pattern held for injuries to the psyche and the hands. The only significant differences among pilot cases occurred for injuries to the wrist and injuries to the arm. Capitated pilot cases had a higher frequency of both of these injuries (11% and 9%) than did non-capitated pilot cases (7% and 5%). As seen above, claims by body part had a higher closure rate among capitated claims relative to non-capitated cases in both pilot and control firms (Table 2.19).

Table 2.19. Rate of Claims Closed by Part of Body, Enrollment Period, and Pilot Status.

	Control Firms			Pilot Firms			
	Pre	During	Post	Pre	During (KOJ)	During (Non-KOJ)	Post
Multiple Body Parts	89%	83%	67%	87%	88%	73%	57%
Back	93%	78%	71%	91%	88%	79%	68%
Finger(s)	96%	94%	100%	98%	95%	95%	81%
Wrist	92%	73%	80%	85%	84%	70%	62%
Psyche	87%	70%	62%	92%	86%	72%	60%
Hand(s)	92%	80%	70%	88%	100%	72%	47%
Knee	95%	69%	58%	92%	100%	80%	76%
Arm(s)	98%	76%	83%	89%	88%	70%	59%
Eye(s)	100%	100%	100%	100%	100%	98%	100%
Shoulder	87%	57%	58%	92%	100%	76%	65%
All Other	94%	87%	77%	95%	94%	86%	73%
Percent of total claims closed	92%	81%	77%	91%	91%	79%	66%

Comparison of Medical and Disability Claims by Study Period and Pilot Status of Firms

In this section, we compare claims that involved medical payments only with those that had both medical and compensation payments.

Table 2.20. Open and Closed Claims by Type of Payment, Enrollment Period, Pilot Status, and Kaiser versus non-Kaiser Treatment.

	Control Firms			Pilot Firms						
	Pre	During	Post	Pre		During (KOJ)	During (Non-KOJ)		Post	
				Kaiser	Non-Kaiser		Kaiser	Non-Kaiser	Kaiser	Non-Kaiser
Medical Only	58%	62%	70%	76%	42%	80%	79%	44%	80%	51%
Temporary Disability	8%	12%	15%	7%	5%	12%	10%	5%	15%	5%
Permanent Disability	8%	7%	2%	15%	9%	8%	9%	7%	5%	1%
Other	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%
No Payment	26%	18%	13%	1%	43%	1%	1%	43%	0%	43%
Total Percent	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Number	2,754	1440	437	1,321	5,552	269	661	2,866	176	627

When considering all open and closed claims, medical only claims were more frequent among both capitated and non-capitated Kaiser cases (80% and 79%) than non-Kaiser cases (44%) (Table 2.20). Claims with medical injuries and temporary disability payments were also more frequent among capitated and non-capitated Kaiser (12% and 10%) than non-Kaiser cases (5%). Most of this discrepancy is due to fact that few Kaiser claims resulted in no payment, in contrast to non-Kaiser claims. Of course, in most of the analyses presented here, we have excluded open claims and claims with payments less than \$5.00.

Table 2.21. Closed Claims by Medical and Compensation Payments and Enrollment Period

	Control Firms			Pilot Firms						
	Pre	During	Post	Pre		During (KOJ)	During (Non-KOJ)		Post	
				Kaiser	Non-Kaiser		Kaiser	Non-Kaiser	Kaiser	Non-Kaiser
Medical Only	82%	81%	85%	82%	80%	83%	87%	85%	80%	95%
Temporary Disability	11%	15%	14%	11%	11%	12%	3%	6%	0%	0%
Permanent Disability	7%	4%	1%	7%	9%	5%	10%	9%	20%	5%
Other payments	1%	0%	0%	1%	1%	0%	0%	0%	0%	0%
Total Percent	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Total Number	1,881	955	290	1,207	2,850	244	547	1,244	136	212

The differences seen in Table 2.20 were dramatically reduced by the exclusion of open claims and those without payment. Focusing on closed claims only, the difference in the frequency of claims with medical only payments in Kaiser (87%) and non-Kaiser FFS (85%) was not significant (Table 2.21). Fewer

Kaiser FFS claims (3%) included temporary disability than non-Kaiser FFS (6%), and permanent disability cases were evenly distributed between both groups.

C. DISTRIBUTION OF MEDIAN MEDICAL COSTS, 1992-1997

This section explores changes in median medical costs over time, comparing trends in types of accident, injury, and body parts injured. Median rather than mean costs were used for these tables since the mean distributions were highly skewed and misleading indicators of costs per typical claim.

Table 2.22. Median Medical Cost per Closed Claim by Nature of Accident and Year.

	1992	1993	1994	1995	1996	1997
Strain/Injury by Miscellaneous	\$342	\$483	\$331	\$390	\$320	\$250
Other Miscellaneous Causes	\$552	\$505	\$767	\$510	\$469	\$362
Cumulative (All Other)	\$2,051	\$1,435	\$1,238	\$1,343	\$1,141	\$997
Strain/Injury by Lifting	\$311	\$398	\$294	\$374	\$330	\$283
Repetitive Motion	\$1,070	\$850	\$595	\$800	\$744	\$422
Fall/Slip on Miscellaneous	\$352	\$200	\$274	\$263	\$291	\$293
Fall/Slip on Same Level	\$345	\$221	\$674	\$343	\$240	\$264
Cut/Injured by Miscellaneous	\$110	\$135	\$153	\$177	\$163	\$158
Injury by Pushing/Pulling	\$199	\$264	\$355	\$327	\$322	\$395
Exposure to Dust/Gas/Vapor	\$159	\$111	\$175	\$410	\$124	\$218
Other	\$149	\$209	\$215	\$206	\$192	\$194
Median Total Costs	\$331	\$342	\$350	\$324	\$260	\$249
Total Number	1,612	1,788	1,609	1,767	1,579	1,211

Median costs of the top two accidents, strain/injury and other miscellaneous causes remained relatively flat from 1992-1997, with a slight decrease from \$342 in 1992 to \$250 in 1997 (Table 2.22). However, a sharp and steady decrease occurred for the third most frequent accident, cumulative, from \$2,051 in 1992 to \$997 in 1997. A similar decrease was also observed for accidents classified as repetitive motion from \$1,070 to \$422. Overall, median cost per claim declined from \$331 to \$249 from 1992 to 1997, a reduction of 25%. Part of this cost reduction is due to the higher portion of open cases among high-cost conditions, such as cumulative injuries.

Table 2.23. Median Medical Cost per Closed Claim by Nature of Injury and Year.

	1992	1993	1994	1995	1996	1997
Strain/Sprain	\$373	\$431	\$400	\$386	\$345	\$269
Bruise	\$144	\$149	\$197	\$185	\$170	\$191
Cut/Puncture	\$128	\$156	\$170	\$173	\$165	\$164
Not Described	\$609	\$623	\$627	\$512	\$235	\$423
Job Stress	\$2,078	\$1,733	\$1,443	\$1,798	\$1,168	\$1,046
Irritant	\$133	\$164	\$136	\$271	\$128	\$152
Multiple Injuries	\$745	\$286	\$989	\$497	\$404	\$312
Cumulative Injury	\$3,121	\$1,123	\$684	\$1,069	\$1,074	\$253
Carpal Tunnel Syndrome	\$976	\$1,506	\$1,001	\$876	\$1,224	\$1,505
Illness	\$170	\$457	\$701	\$134	\$147	\$384
All Other	\$169	\$199	\$243	\$181	\$256	\$182
Median Total Costs	\$331	\$342	\$350	\$324	\$260	\$249
Total Number	1,612	1,788	1,609	1,767	1,579	1,211

The median medical costs for the most common injury, strain/sprain increased from 1992 (\$373) to 1993 (\$431) followed by a steady decrease through 1997 (\$269) (Table 2.23). Other less common injuries such as job stress and cumulative injuries showed dramatic decreases in median costs. The median costs of job stress injuries dropped from \$2,078 to \$1,046 and those of cumulative injuries dropped from \$3,121 to \$253. These shifts in median costs may have been less dramatic if more claims had been closed by the end of 1997. Both injuries are likely to have a lengthy healing process and if more claims were closed, median costs may have decreased less dramatically for these injuries.

Table 2.24. Median Medical Cost per Closed Claim by Part of Body and Year.

	1992	1993	1994	1995	1996	1997
Multiple Body Parts	\$438	\$409	\$581	\$436	\$308	\$280
Back	\$432	\$616	\$520	\$434	\$390	\$402
Finger(s)	\$1,856	\$1,748	\$1,395	\$1,842	\$1,227	\$1,059
Wrist	\$1,181	\$669	\$479	\$550	\$296	\$238
Psyche	\$137	\$146	\$188	\$189	\$190	\$182
Hand(s)	\$233	\$249	\$264	\$206	\$197	\$232
Knee	\$188	\$294	\$330	\$225	\$286	\$251
Arm(s)	\$155	\$292	\$588	\$274	\$236	\$165
Eye(s)	\$396	\$376	\$613	\$332	\$382	\$380
Shoulder	\$120	\$142	\$151	\$140	\$129	\$148
All Other	\$224	\$225	\$260	\$273	\$247	\$220
Median Total Costs	\$331	\$342	\$350	\$324	\$260	\$249
Total Number	1,612	1,788	1,609	1,767	1,579	1,211

While the median cost of injuries to multiple body parts decreased slightly overall, the decrease was somewhat larger between 1994 and 1997, from \$581 to \$280 (Table 2.24). The cost of back injuries did not vary significantly, but claims for finger injuries dropped from \$1,856 to \$1,059 from 1992 to 1997.

Comparisons by Study Period, Pilot Status of Firms, and Kaiser versus Non-Kaiser Care

We compared the median costs of claims by nature of accident and injury, as well as the body part injured in this section. The median costs were compared for Kaiser and non-Kaiser FFS care provided to employees of pilot firms in the periods before, during and post implementation of the pilot program. Secondly, the median costs of capitated Kaiser care were compared to Kaiser FFS care during project implementation.

For the period during the 24-hour pilot program, Kaiser FFS care was almost always less expensive than other FFS providers (Table 2.25). During the pilot program, the median claim in Kaiser FFS was \$167, compared to \$330 in non-Kaiser FFS, \$286 in KOJ, and \$271 in the control firms. The median cost of a KOJ claim for strain/injury accidents was slightly higher (\$216) than Kaiser FFS (\$194) but much lower than non-Kaiser FFS (\$452). For other miscellaneous injuries the median cost of a capitated Kaiser claim (\$340) was about \$200 more than Kaiser FFS care (\$146).

Table 2.25. Median Medical Cost per Closed Claims by Nature of Accident and Enrollment Period.

	Control Firms			Pilot Firms						
	Pre	During	Post	Pre		During KOJ	During (Non-KOJ)		Post	
				Kaiser	Non-Kaiser		Kaiser	Non-Kaiser	Kaiser	Non-Kaiser
Strain/Injury by Misc.	\$427	\$341	\$300	\$184	\$474	\$216	\$194	\$452	\$156	\$250
Other Misc. Causes	\$643	\$349	\$204	\$633	\$708	\$340	\$146	\$505	\$186	\$353
Cumulative (All Other)	\$1,373	\$1,256	\$619	\$1,789	\$1,836	\$686	\$198	\$975	NSD	\$1,046
Strain/Injury by Lifting	\$409	\$394	\$214	\$150	\$473	\$243	\$171	\$435	\$328	\$712
Repetitive Motion	\$850	\$660	\$434	\$595	\$829	\$827	\$389	\$660	NSD	\$559
Fall/Slip on Miscellaneous	\$380	\$323	\$265	\$174	\$335	\$324	\$205	\$321	\$142	\$274
Fall/Slip on Same Level	\$340	\$272	NSD	\$154	\$542	\$182	\$124	\$373	NSD	\$689
Cut/Injured by Misc.	\$120	\$179	\$160	\$129	\$136	NSD	\$156	\$188	\$161	\$197
Injury by Pushing/Pulling	\$360	\$298	\$271	\$127	\$402	\$806	\$305	\$505	\$634	NSD
Dust/Gas/Vapor Exposure	\$233	\$158	NSD	\$210	\$159	\$419	\$134	\$146	NSD	\$462
All Other	\$621	\$1,270	\$218	NSD	\$643	\$243	NSD	\$882	NSD	NSD
Median Total Costs	\$370	\$271	\$207	\$192	\$466	\$286	\$167	\$330	\$164	\$261
Total N	1,881	955	290	1,207	2,850	244	547	1,244	136	212

Note: NSD = not sufficient data.

Table 2.26. Median Medical Cost per Closed Claim by Nature of Injury and Enrollment Period.

	Control Firms			Pilot Firms						
	Pre	During	Post	Pre		During (KOJ)	During (Non-KOJ)		Post	
				Kaiser	Non-Kaiser		Kaiser	Non-Kaiser	Kaiser	Non-Kaiser
Strain/Sprain	\$421	\$374	\$256	\$192	\$545	\$286	\$207	\$397	\$158	\$270
Bruise	\$182	\$245	\$199	\$119	\$178	\$208	\$139	\$189	\$185	\$131
Not Described	\$583	\$220	\$309	\$278	\$705	\$220	\$136	\$531	\$753	\$359
Job Stress	\$1,437	\$1,270	\$815	\$3,232	\$1,759	\$194	NSD	\$1,372	NSD	\$831
Cut/Puncture	\$173	\$189	\$159	\$155	\$141	\$163	\$153	\$168	\$166	\$163
Irritant	\$174	\$146	\$111	\$139	\$140	\$180	\$148	\$207	\$157	\$475
Multiple Injuries	\$560	\$344	\$264	\$305	\$578	\$441	\$259	\$484	\$167	\$689
Cumulative Injury	\$1,164	\$2,071	NSD	\$1,364	\$1,895	\$648	\$190	\$872	NSD	\$380
Carpal Tunnel Syndrome	\$1,415	\$858	NSD	\$762	\$1,064	NSD	NSD	\$1,236	NSD	NSD
Illness	\$250	\$755	\$321	\$414	\$535	NSD	\$66	\$134	NSD	\$806
All Other	\$246	\$228	\$169	\$196	\$186	\$324	\$101	\$201	\$238	\$151
Median Total Costs	\$370	\$271	\$207	\$192	\$466	\$286	\$167	\$330	\$164	\$261
Total Number	1,881	955	290	1,207	2,850	244	547	1,244	136	212

Note: NSD = not sufficient data.

For the top three injuries, Kaiser FFS was always less costly than non-Kaiser FFS (Table 2.26). For example, for strains and sprains, median cost in Kaiser FFS was \$207 while non-Kaiser FFS care median cost was \$397. Alternatively, the median cost of Kaiser capitated care was consistently higher than Kaiser FFS care during the program period. For example, the median capitated cost of

strain/sprain injuries was \$286 versus \$207 for Kaiser FFS care. Despite the apparently higher costs of Kaiser capitated care, it is difficult to conclude that capitated care was more expensive than FFS care without the results of a multivariate analysis that controls for possible confounders.

Table 2.27. Median Medical Cost per Closed Claim by Part of Body and Enrollment Period.

	Control Firms			Pilot Firms						
	Pre	During	Post	Pre		During (KOJ)	During (Non-KOJ)		Post	
				Kaiser	Non-Kaiser		Kaiser	Non-Kaiser	Kaiser	Non-Kaiser
Multiple Body Parts	\$503	\$390	\$345	\$197	\$627	\$548	\$163	\$446	\$125	\$862
Back	\$567	\$454	\$286	\$169	\$631	\$307	\$196	\$419	\$387	\$490
Finger(s)	\$1,430	\$1,271	\$945	\$3,232	\$1,764	\$194	\$768	\$1,372	\$49	\$846
Wrist	\$681	\$397	\$173	\$714	\$729	\$608	\$176	\$534	\$109	\$256
Psyche	\$167	\$186	\$166	\$137	\$161	\$289	NSD	\$215	NSD	\$194
Hand(s)	\$252	\$249	\$200	\$195	\$264	\$407	\$104	\$237	\$131	\$222
Knee	\$330	\$256	\$160	\$201	\$257	\$236	\$279	\$278	\$160	\$490
Arm(s)	\$336	\$215	\$162	\$354	\$209	\$324	\$185	\$234	\$109	\$128
Eye(s)	\$374	\$297	\$80	\$189	\$597	\$738	\$204	\$538	\$960	\$766
Shoulder	\$149	\$130	\$114	\$131	\$116	\$180	\$111	\$222	NSD	\$175
All Other	\$313	\$263	\$240	\$154	\$286	\$175	\$182	\$281	\$177	\$328
Median Total Costs	\$370	\$271	\$207	\$192	\$466	\$286	\$167	\$330	\$164	\$261
Total Number	1,881	955	290	1,207	2,850	244	547	1,244	136	212

Note: NSD = not sufficient data.

A similar trend existed for injuries to different body parts. The median cost of care was higher for non-Kaiser FFS than Kaiser FFS for the top three most frequent injuries (Table 2.27). For example, for injuries to multiple body parts, the median Kaiser FFS costs were \$163 compared to \$446 for non-Kaiser FFS care. Alternatively, the median cost of capitated care at Kaiser for multiple body part injuries was \$548 compared to Kaiser FFS costs of \$163. The cost of Kaiser capitated care was also greater than the median costs associated with non-Kaiser FFS (\$446).

Comparisons by Type of Claim

As observed in the previous section, the median cost of claims was usually lower for Kaiser FFS than non-Kaiser FFS care. For claims with a medical component only during the program implementation phase, the median Kaiser FFS claim cost \$149 compared to \$261 for a non-Kaiser FFS claim and \$234 for a KOJ claim (Table 2.28).

Table 2.28. Median Total Cost per Closed Claim by Medical and Compensation Payments and Enrollment Period.

	Control Firms			Pilot Firms						
	Pre	During	Post	Pre		During (KOJ)	During (Non-KOJ)		Post	
				Kaiser	Non-Kaiser		Kaiser	Non-Kaiser	Kaiser	Non-Kaiser
Medical Only	\$278	\$241	\$191	\$151	\$308	\$234	\$149	\$261	\$156	\$256
Temporary Disability	\$1,389	\$968	\$656	\$546	\$1,113	\$1,221	\$804	\$1,108	\$522	\$878
Permanent Disability	\$18,503	\$19,549	NSD	\$14,068	\$13,113	\$9,407	\$23,408	\$8,134	NSD	\$7,273
Other payments	\$5,241	NSD	NSD	\$5,582	\$6,407	NSD	NSD	NSD	NSD	NSD
Median Total Costs	\$404	\$307	\$220	\$202	\$501	\$308	\$174	\$363	\$189	\$279
Total Number	1,881	955	290	1,207	2,850	244	547	1,244	136	212

Note: NSD = not sufficient data.

Payments with a temporary disability component as well as a medical component cost \$804 for Kaiser FFS compared to \$1,108 for non-Kaiser FFS claims and \$1,221 for a KOJ claim. The median costs of cases with permanent disabilities did not follow the same pattern, although these were relatively rare events compared to the medical only and temporary disability claims.

Comparison of Length of Service

Differences in cost may be due to the length of service (LOS), or the time it took for a claim to be closed. The comparison of the median number of days per closed claims by for Kaiser FFS and non-Kaiser FFS care revealed a shorter LOS for Kaiser FFS cases with medical payments alone or medical and temporary disability payments.

Table 2.29. Median Length of Service (Days) per Closed Claim, by Enrollment Period.

	Control Firms			Pilot Firms						
	Pre	During	Post	Pre		During (KOJ)	During (Non-KOJ)		Post	
				Kaiser	Non-Kaiser		Kaiser	Non-Kaiser	Kaiser	Non-Kaiser
Medical Only	24	18	10	15	50	18	14	42	10	53
Temporary Disability	48	36	23	18	33	48	25	51	22	39
Permanent Disability	836	528	413	851	786	99	583	433	NSD	NSD
Other	553	793	NSD	435	467	NSD	NSD	NSD	NSD	NSD
Median Total Days	40	24	14	24	64	18	17	49	13	48
Total Number	1,881	955	290	1,207	2,850	244	547	1,244	136	212

Note: NSD = not sufficient data.

For example, the median LOS for Kaiser FFS medical only claims during the 24-hour project period was 14 days compared to 18 days for KOJ claims and 42 days for non-Kaiser FFS claims (Table 2.29). Clearly, the lower costs of Kaiser FFS claims in Table 2.28 were due at least in part to the fact that Kaiser closed its medical and temporary disability claims faster than non-Kaiser providers. KOJ claims were closed substantially more quickly than Kaiser FFS claims for permanent disability, but

slightly less quickly for medical only and temporary disability claims. Overall, KOJ claims were closed essentially as quickly as Kaiser FFS claims (18 versus 17 days).

D. DISTRIBUTION OF DIAGNOSES AND COSTS AMONG KOJ CLAIMS FOR SELF-INSURED AND SCIF-INSURED FIRMS

Kaiser provided capitated workers' compensation care under the 24-hour pilot program to 5 self-insured firms. As discussed at the beginning of this Section, a total of 1,053 claims occurred within these firms during their enrollment in KOJ, while another 244 claims occurred within pilot firms insured by SCIF. Because the self-insured claims lacked detailed information about the nature of injury, body part injured, and other important information necessary to control for confounding, we were not able to include the self-insured claims in our analyses. Nevertheless, the large volume of claims in these self-insured firms raises a basic question regarding the SCIF-insured KOJ claims, namely: How representative were the SCIF-insured claims, since they represented only 18.8% (244/1,297) of the total KOJ claims?

In this section, we compare the distribution of diagnoses, service use, and associated costs of KOJ claims in self-insured firms compared to SCIF-insured firms to determine how representative the latter were of overall claims under KOJ. The costs per claim reported in this section are somewhat lower than reported in the previous tables, because these claims represent only the medical costs incurred by Kaiser. The analyses presented throughout the rest of this Section were based on merged Kaiser and SCIF claims, and thus capture medical costs paid by both Kaiser and SCIF.

Table 2.30. Distribution of Diagnoses and Total Costs and Median Cost per Claim Among KOJ Claims, by Self-Insured Status.

Major ICD-9 Categories	Portion of Diagnosis			Portion of Total Costs			Median Cost per Claim		
	Total KOJ	SCIF	Self Insured	Total KOJ	SCIF	Self Insured	Total KOJ	SCIF	Self Insured
Injury and poisoning	66%	58%	67%	55%	45%	58%	\$195	\$221	\$192
Musculoskeletal	18%	13%	19%	27%	26%	28%	\$490	\$418	\$503
Infectious disease	6%	21%	2%	4%	21%	1%	\$207	\$215	\$165
Central nervous system	4%	3%	4%	8%	6%	9%	\$584	\$731	\$579
Mental disorders	2%	NSD	2%	2%	NSD	2%	\$750	NSD	\$750
Skin	2%	NSD	2%	<1%	NSD	<1%	\$105	NSD	\$105
Ill defined conditions	1%	2%	1%	1%	2%	1%	\$200	\$506	\$115
Respiratory system	1%	NSD	1%	<1%	NSD	<1%	\$315	NSD	\$315
Digestive system	NSD	NSD	NSD	NSD	NSD	NSD	NSD	NSD	NSD
Circulatory system	NSD	NSD	NSD	NSD	NSD	NSD	NSD	NSD	NSD
Missing	2%	NSD	2%	1%	NSD	1%	\$131	NSD	\$136
Total	100%	100%	100%	\$777,695	\$130,298	\$647,397	\$225	\$229	\$223

Note: ICD-9 = International Classification of Diseases, 9th Edition. NSD = Not sufficient data.

The most common diagnosis for all KOJ cases (66%) was injury and poisoning (Table 2.30). Among the three most common diagnoses, there were large discrepancies between SCIF and self-insured firms in the distribution of claims. SCIF-insured KOJ injuries were much more likely to be for infectious diseases and less likely to be for injury or musculoskeletal problems. Although the median costs

differed by diagnosis between SCIF-insured and self-insured KOJ claims, the overall median costs across all diagnoses was essentially the same (\$229 and \$223, respectively). This is primarily due to the fact that two of the three most common diagnoses had very similar median costs, and these two diagnoses accounted for about 72% of total KOJ claims. We conclude, therefore, that while the distribution of claims differed by diagnosis between SCIF-insured and self-insured firms in the 24-hour pilot programs, the SCIF-insured claims were representative of the costs of all KOJ claims.

Table 2.31. Distribution of Total Costs per Service Category Among KOJ Claims, by Self-Insured Status.

Service Categories	Portion of Total Costs		
	Total KOJ	SCIF	Self Insured
Physiotherapy/Rehabilitation	19%	19%	19%
Evaluation and Management Services	38%	42%	37%
Supplies	3%	4%	3%
Radiology	9%	9%	9%
Pathology	2%	1%	2%
Neurology Tests	4%	5%	4%
Musculoskeletal System	6%	4%	6%
Anesthesia	10%	2%	12%
Immunizations	<1%	<1%	<1%
Miscellaneous	2%	5%	1%
Other	6%	9%	6%
Total	\$777,695	\$130,298	\$647,397

Note: Service categories defined using Current Procedural Terminology (CPT) codes.

Evaluation and management services (i.e., office visits) accounted for the largest share of total medical costs, accounting for 42% of total medical costs among SCIF-insured KOJ claims and 37% among self-insured KOJ claims (Table 2.31). The other large discrepancy occurred in anesthesia, which accounted for only 2% of total medical costs among SCIF-insured KOJ claims but 12% among self-insured claims. This discrepancy may be explained by the greater share of claims with diagnoses within the injury and musculoskeletal categories in self-insured firms. These diagnoses may be more likely to require anesthesia for treatment, particularly for minor injuries.

E. THE EFFECT OF CAPITATION ON THE COSTS OF CLOSED MEDICAL CLAIMS

A clear profile of the distribution, trends, and costs of workers’ compensation claims have emerged in the previous descriptive analyses presented in this Section. However, the impact of capitation on workers’ compensation medical costs cannot be measured without isolating the impact of capitation from other contributing factors. To control for all of the possible confounding factors, including changes in the distribution of claims over time, we used multivariate log-linear regression models to determine the effect of Kaiser capitated care on the medical claims cost. Log-linear models are commonly used when the dependent variable, in this case total medical costs, is highly skewed. The logarithmic transformation typically makes such highly skewed variables more normally distributed. The only limitation of such models is that the regression coefficients cannot be directly interpreted without first transforming them back to a non-logarithmic scale.

The other common problem with cost data is that even after transformation, the data may exhibit a non-constant variance. For example, claims of short duration on average may have a relatively narrow variance compared to high-cost claims. This problem, known as heteroscedasticity, violates one of the key assumptions of regression analysis, namely, that variance in the dependent variable is constant. To address problems in our claims data related to heteroscedasticity, we stratified the data into five more homogeneous categories: (1) claims with temporary or permanent disability payments closed within 30 days; (2) claims with medical only payments closed within 30 days; (3) claims with temporary or permanent disability payments closed after 30 days; (4) claims with medical only payments closed after 30 days but within 1 year; and (5) claims with medical only payments closed after 1 year. Stratifying the claims data into these five categories eliminated the heteroscedasticity observed in the pooled data and maintained a pattern of normally distributed errors.

Table 2.32 shows the descriptive characteristics of the 9,566 claims presented in our previous descriptive analyses and used in a multivariate analyses, comparing pilot and control firms. The claims differed in several important respects. Pilot firms had more claims in the period before the program implementation (63% vs. 60%) but had fewer claims in the period post implementation (5% vs. 9%). Pilot firms had slight less temporary disability claims (9% vs. 12%) than control firms, and slightly more permanent disability claims (8% vs. 5%). More claims from the pilot firms came from southern California than control firms (19% vs. 11%). Pilot firms had a higher frequency of strains (44% vs. 41%), but a lower frequency of stress injuries (7% vs. 11%). The claimants in pilot firms were more often older than 50 (21% vs. 16%) than the control firm claimants. More claimants in pilot firms were women (62% vs. 53%). Because of the large number of claims in both the pilot and control firms (6,440 and 3,126, respectively), even small differences in the distribution of claims are statistically significant at the 0.05 level. Despite these small but significant differences in the distribution of claims between pilot and control firms, our multivariate analyses control for these distributional differences.

Table 2.32. Claims by Characteristics of Pilot and Control Firms.

	Control	Pilot	X ²
Enrollment Period			
Injury before firm's enrollment (Pre)	60%	63%	**
Injury during firm's enrollment (During)	31%	32%	
Injury after firm's disenrollment (Post)	9%	5%	***
Payment Type			
Medical only payments	82%	82%	
Temporary disability payments	12%	9%	***
Permanent partial and total disability payments	5%	8%	***
Other payments	0%	0%	
Region			
Southern vs. Northern California	11%	19%	***
Length of Service			
Less than 65% of payment were made in the first 3 months	21%	25%	
Nature of Injury			
Strain	41%	44%	**
Bruise	11%	11%	
Unknown injury	8%	8%	
Stress	8%	7%	
Cut	11%	7%	***
Irritant	6%	5%	
Multiple injuries	4%	4%	
Cumulative injuries	1%	2%	***
Carpal Tunnel Syndrome	2%	2%	
Illness	0%	2%	***
Other injuries	7%	7%	
Body part			
Multiple body parts	14%	17%	***
Back	17%	15%	
Wrist	8%	8%	
Finger	10%	7%	***
Hand	6%	5%	
Knee	5%	5%	
Arm	4%	5%	*
Shoulder	3%	4%	
Eye	5%	3%	***
Other body parts	29%	30%	
Age of Injured			
Less than 25	7%	5%	***
Between 25 and 50	75%	73%	*
More than 50	16%	21%	***
Age unknown	2%	1%	***
Gender of Injured			
Female	53%	62%	***

* p<0.05; ** p<0.01; *** p<0.001

Table 2.33. Multivariate Analysis of Logarithm of Medical Costs Per Closed Claim.

	Model 1		Model 2		Model 3		Model 4		Model 5	
	DAYS<=30		DAYS<=30		DAYS>30		365>DAYS>30		DAYS>365	
	Disability		Medical Only		Disability		Medical Only		Medical Only	
	Beta	p	Beta	p	Beta	p	Beta	p	Beta	p
Enrollment Period										
Pre (reference group)										
During	-8.49	0.68	2.20	0.72	4.38	0.76	-5.25	0.60	26.86	0.50
Post	-7.41	0.78	-10.31	0.21	-35.55	0.12	-38.42	0.00	--	--
Firm and Provider Type										
Control (reference group)										
Pilot/Non-Kaiser	-0.48	0.97	-8.64	0.01	-13.89	0.05	-15.63	0.00	0.07	1.00
Pilot/Kaiser	-38.21	0.00	-30.95	0.00	-22.17	0.01	-32.89	0.00	-3.90	0.84
Firm/Enrollment Period Interactions										
Pilot/Non-Kaiser*During	-5.76	0.76	-8.39	0.15	17.66	0.23	6.29	0.54	-31.54	0.29
Pilot/Kaiser*During (non-KOJ)	50.55	0.09	4.21	0.55	6.72	0.74	-2.29	0.86	-20.07	0.63
Pilot/Kaiser*During (KOJ)	38.97	0.20	33.40	0.00	0.91	0.96	57.84	0.00	80.46	0.33
Pilot/Non-Kaiser*Post	293.90	0.01	17.67	0.13	10.71	0.83	44.43	0.04	--	--
Pilot/Kaiser*Post	19.53	0.55	31.30	0.02	39.10	0.43	67.90	0.03	--	--
Firm Type										
Public Agency	-12.00	0.51	-18.48	0.00	-3.42	0.81	-17.24	0.18	-35.36	0.31
Other (reference group)										
Number of Employees										
<100	-44.23	0.04	-9.20	0.23	17.46	0.39	-20.45	0.19	-57.02	0.15
100-499	-42.12	0.04	-12.08	0.04	11.61	0.46	-31.74	0.00	3.10	0.93
500-999	-45.54	0.09	-17.55	0.06	8.05	0.75	-34.41	0.05	-2.17	0.98
1000+ (reference group)										
Firm Location										
Southern CA	23.07	0.10	18.50	0.00	-0.58	0.96	14.24	0.21	-41.57	0.14
Northern CA (reference group)										
Nature of Injury										
Bruise	0.22	0.99	6.94	0.07	-15.29	0.16	-14.99	0.07	2.55	0.92
Unknown	20.49	0.32	19.96	0.00	-12.42	0.20	-5.82	0.40	-35.46	0.03
Stress	74.77	0.30	5.75	0.69	20.69	0.13	56.77	0.00	19.46	0.41
Cut	14.98	0.38	4.97	0.25	-6.82	0.69	-21.42	0.10	-60.35	0.35
Irritant	-15.80	0.78	-0.20	0.97	-25.71	0.28	-1.88	0.86	5.99	0.87
Multiple Injuries	64.36	0.02	33.15	0.00	38.38	0.01	-0.01	1.00	-8.58	0.76
Cumulative Injury	16.32	0.81	39.84	0.09	-25.30	0.05	-11.36	0.35	13.27	0.61
Carpal Tunnel	--	--	20.23	0.31	7.31	0.66	9.41	0.45	73.51	0.04
Illness	--	--	90.44	0.00	-60.35	0.05	-40.59	0.00	-87.45	0.00
Strain (reference group)										

Table 2.33. Multivariate Analysis of Logarithm of Medical Costs Per Closed Claim (cont.).

Body Part Injured										
Back	-14.45	0.31	-2.29	0.64	-1.37	0.88	13.81	0.09	20.02	0.38
Wrist	0.32	0.99	-10.11	0.09	-10.34	0.34	-10.05	0.23	-36.48	0.04
Finger	-9.33	0.60	2.25	0.67	-16.75	0.26	-30.76	0.00	-5.99	0.87
Hand	-14.00	0.48	1.74	0.77	-6.99	0.63	-28.55	0.00	-6.83	0.79
Knee	-7.06	0.72	0.61	0.92	12.75	0.35	-12.13	0.26	-48.48	0.05
Arm	-22.02	0.36	-2.19	0.73	-21.68	0.12	-14.36	0.14	-29.31	0.25
Shoulder	-0.77	0.97	-3.80	0.62	4.94	0.74	-12.76	0.24	48.96	0.27
Eye	49.84	0.52	-0.40	0.95	-41.00	0.24	-32.39	0.05	-32.06	0.55
Other	2.33	0.88	9.74	0.02	7.31	0.45	-20.12	0.00	16.37	0.42
Multiple (reference group)										
Type of Claim										
Permanent Disability	539.64	0.00	--	--	90.57	0.00	--	--	--	--
Temporary (reference group)										
Type of Treatment										
Surgery	5.74	0.82	15.52	0.11	107.17	0.00	19.62	0.69	88.06	0.73
Medical (reference group)										
Age										
<25	-25.16	0.01	-0.51	0.91	10.52	0.46	-4.24	0.75	-62.15	0.11
25-50 (reference group)										
>50	2.15	0.87	-2.36	0.47	11.38	0.11	1.24	0.80	-14.00	0.26
Unknown	-4.46	0.90	-7.42	0.32	14.51	0.67	-37.33	0.01	-50.54	0.17
Gender										
Female	-28.22	0.00	-12.01	0.00	-6.74	0.31	5.08	0.33	-20.67	0.13
Male (reference group)										
Length of Service of Claim										
Days	5.38e-2	0.03	5.77e-2	0.00	0.26e-2	0.00	1.17e-2	0.00	0.04e-2	0.61
Days Squared	-4.27e-4	0.58	-7.62e-4	0.00	-0.08e-5	0.00	-2.18e-5	0.00	0.05e-5	0.91
Year of Claim										
1992	0.38	0.98	-5.37	0.26	29.39	0.02	-2.68	0.73	9.45	0.66
1993	-7.65	0.65	0.30	0.95	21.65	0.06	-11.21	0.12	-13.17	0.48
1994	1.55	0.93	7.33	0.14	9.10	0.40	-1.74	0.81	-22.88	0.20
1995 (reference group)										
1996	-19.24	0.20	0.84	0.85	-6.43	0.55	-5.45	0.44	7.24	0.78
1997	2.79	0.88	4.60	0.43	-7.07	0.66	-6.03	0.50	174.94	0.47
Constant	283.74	0.00	121.64	0.00	739.65	0.00	350.67	0.00	1988.63	0.00
N	461		4011		1231		3244		612	
Adj. R ²	0.2191		0.1955		0.4986		0.1557		0.0535	
F	4.00		23.15		28.18		14.60		1.84	
p	<0.0002		<0.0002		<0.0002		<0.0002		0.0014	

The results in Table 2.33 present the impact of capitation, controlling for other confounding factors, on medical costs per claim. The results represent the original regression coefficients, retransformed into dollar terms. Because almost every independent variable shown in Table 2.33 is a categorical variable,

the transformed regression coefficients are interpreted as the percentage difference in costs between the category designated by the variable compared to the appropriate reference group for that category. For example, for model 1, the results indicate that costs in 1997 were 2.79% higher than in 1995, and that this difference was not statistically significant.

Before discussing the results related to the impact of 24-hour coverage, a few other findings are worth noting. In general, claims in the post 24-hour coverage period were less expensive, controlling for all other factors. However, only in model 4 was this effect statistically significant. Small and medium-sized firms tended to have lower-cost claims relative to large (1000+) firms. Stress-related claims tended to be more costly than most other claims, although this difference was statistically significant only in model 4. Finally, women tended to have less expensive claims relative to men.

Table 2.34. Percent Change in Average Cost of Closed Claims by Type of Claim, Pilot Status, and Type of Insurance Within Pilot Firms.

	Control	Pilot		
		Non-Kaiser	Kaiser	
			non-KOJ	KOJ
Model 1: Disability Claims <=30 Days				
Pre	0.0	-0.5	-38.2	n/a
During	-8.5	-14.2	-14.9	-21.4
Post	-7.4	263.0	-31.6	n/a
Model 2: Medical Only Claims <=30 Days				
Pre	0.0	-8.6	-30.9	n/a
During	2.2	-14.5	-26.5	-5.9
Post	-10.3	-3.6	-18.7	n/a
Model 3: Disability Claims > 30 Days				
Pre	0.0	-13.9	-22.2	n/a
During	4.4	5.8	-13.3	-18.0
Post	-35.5	-38.6	-30.2	n/a
Model 4: Medical Only Claims >30 Days, <=365 Days				
Pre	0.0	-15.6	-32.9	n/a
During	-5.3	-15.0	-37.9	0.4
Post	-38.4	-25.0	-30.6	n/a
Model 5: Medical Only Claims >365 Days				
Pre	0.0	0.1	-3.9	n/a
During	26.9	-13.1	-2.6	120.0
Post	n/a	n/a	n/a	n/a

Note: All comparisons are relative to control firms in the pre 24-hour period.

Table 2.34 summarizes the impact of 24-hour coverage (i.e., KOJ) relative to non-KOJ Kaiser FFS care within the pilot firms, non-Kaiser care within the pilot firms, and all care within the control firms, based on the regression coefficients shown in Table 2.33. Because of the complicated patterns of comparison discussed below, it is difficult to present all the tests of significance in a single table. Each significant finding discussed in the remainder of this section is at least at the .05 level.

Several important conclusions can be drawn from the data in Table 2.34. First, the average cost per claim was significantly lower in pilot firms in the period prior to the 24-hour pilot programs. In models

2-4, non-Kaiser claims in pilot firms were significantly less costly (between 8.6 and 15.6%) than control firm claims. In models 1-4, Kaiser FFS claims were also significantly less costly (between 22.2 and 38.2%) than control firm claims. In models 1, 2, and 4, Kaiser FFS claims were significantly less costly than non-Kaiser claims within the pilot firms. These findings indicate that Kaiser had a substantial cost advantage prior to the implementation of the 24-hour coverage pilot programs.

Second, in models 1-4, costs declined more within control firms than in pilot firms. In fact, average claim costs increased in models 1, 2, and 4 for Kaiser FFS care between the pre and post 24-hour study period. Thus, the cost advantage within pilot firms, particularly among Kaiser FFS claims, relative to control firms was substantially reduced by the end of 1997.

Finally, the impact of KOJ differed by type of claim. For temporary and permanent disability claims (models 1 and 3), KOJ claims were *less* expensive than both Kaiser FFS (by 6.5 and 4.7%, respectively) and non-Kaiser claims within the pilot firms, and *less* expensive than claims within control firms. None of these differences was statistically significant, however. For medical only claims (models 2, 4, and 5), KOJ claims were substantially *more* expensive than both Kaiser FFS and non-Kaiser claims within pilot firms. These differences were all significant at the .05 level. Because the vast majority of claims involved medical only payments (82.3%), our findings suggest that KOJ claims in general were more expensive controlling for all other factors. In models 2 and 4, with most of the medical only claims, KOJ were 20 to 34% more expensive than Kaiser FFS claims within pilot firms.

Table 2.35. Average Baseline Cost of Closed Claims by Type of Claim, Pilot Status, and Type of Insurance Within Pilot Firms.

	Control	Pilot		
		Non-Kaiser	Kaiser	
			non-KOJ	KOJ
Model 1: Disability Claims <=30 Days				
Pre	\$284	\$282	\$175	n/a
During	\$260	\$244	\$242	\$223
Post	\$263	\$1,030	\$194	n/a
Model 2: Medical Only Claims <=30 Days				
Pre	\$122	\$111	\$84	n/a
During	\$124	\$104	\$89	\$115
Post	\$109	\$117	\$99	n/a
Model 3: Disability Claims > 30 Days				
Pre	\$740	\$637	\$576	n/a
During	\$772	\$782	\$641	\$606
Post	\$477	\$454	\$516	n/a
Model 4: Medical Only Claims >30 Days, <=365 Days				
Pre	\$351	\$296	\$235	n/a
During	\$332	\$298	\$218	\$352
Post	\$216	\$263	\$243	n/a
Model 5: Medical Only Claims >365 Days				
Pre	\$1,989	\$1,990	\$1,911	n/a
During	\$2,523	\$1,728	\$1,938	\$4,375
Post	n/a	n/a	n/a	n/a

Note: Baseline costs are average costs estimated from the multivariate analysis for injured employees during 1995 in

private firms with 1000+ employees in Northern Calif. with a strains to multiple body parts, age 25-50, and male. Table 2.35 displays the same data in Table 2.34 using baseline costs in each model to anchor the percentage change in each of the categories. Baseline costs are defined according to the reference categories listed for each category of independent variables in Table 2.33, and for control firms in the pre period, are equal to the constant term reported in Table 2.33.

Table 2.36. 24-Hour Premiums Collected by Kaiser from Pilot Firms Compared to Total Medical Costs if Claims Had Been Paid at the Prevailing Official Medical Fee Schedule.

Location	Total Premiums	Total Medical Costs	Medical Loss Ratio = Costs/Premiums
North	\$566,944	\$525,338	92.7%
South	\$1,360,949	\$781,340	57.4%
Total	\$1,927,893	\$1,306,678	67.8%

Note: Excludes Kaiser as an employer, since no premiums were collected internally.

Finally, total premiums collected from pilot firms in the KOJ 24-hour pilot and the total value of KOJ claims are shown in Table 2.36. The value of claims was calculated by applying the state of California Official Medical Fee Schedule payment rates used for workers' compensation FFS claims to KOJ claims. The total claims reported in this table include both open and closed claims, as well as claims that were inherited by KOJ when previously injured employees chose to join KOJ. In contrast, previous tables in this Section were based on new injuries that occurred while employees were enrolled in KOJ.

The total medical costs column shows how much pilot employers would have paid had they paid their KOJ claims under prevailing payment rates under the Workers' Compensation Official Medical Fee Schedule. Across all the pilot firms, Kaiser paid out 67.8% of the premium dollars it collected under the KOJ 24-hour pilot. Therefore, pilot firms paid 47.5% *more* in KOJ premiums than if they had paid for each KOJ claim on a FFS basis.

SECTION 3: ENROLLMENT SURVEY

PURPOSE: To determine how employees who voluntarily enrolled in 24-hour coverage differed from employees who chose not to enroll.

MAJOR FINDING: Satisfaction with pay, age, and certain chronic conditions increased the odds of enrolling in the pilot program, while perceived job risk, minority ethnicity status, and professional occupation decreased the odds of enrolling. Our findings suggest that employee trust may play an important role in determining if managed care can be successfully used in state workers' compensation programs.

EMPLOYEE ENROLLMENT SURVEY

We conducted an employee enrollment survey to describe and compare who enrolled in the 24-hour pilot program with those who did not. One concern was to determine whether enrollment in 24-hour coverage led to favorable or unfavorable risk selection. While understanding selection into non-occupational health plans is relatively easy in comparison, selection in occupational or workers' compensation settings may be more difficult to detect. For example, in non-occupational health plans, health care use may be fairly predictable based on past year's utilization, especially for high-risk groups. In contrast, for workers compensation, the likelihood that anyone might be injured is much lower, making use less predictable and therefore, selection more difficult to determine.

Because Kaiser was the only insurer that had significant enrollment in the 24-hour coverage pilot, we surveyed only those employees who enrolled in Kaiser 24-hour program (known as Kaiser on the Job, or KOJ) or who were offered enrollment but declined. Enrollment in 24-hour coverage required employees not only to fill out a form designating their choice, but to enroll in Kaiser for their group health benefits if they had not already done so.

DATA COLLECTION

The employee enrollment survey was conducted by telephone using computer-assisted telephone interviewing (CATI) methods. We interviewed 448 respondents out of 670 randomly selected potential respondents (66.7%) over a seven-month time period (June 1998 to January 1999). The survey participants were drawn from a convenience sample of 9 firms (7 with more than 500 employees) that participated in the original pilot and also agreed to allow us to contact non-participating employees regarding their reasons for non-participation. From each of the 9 employers, we requested employee telephone numbers for a random sample of 40 employees (20 enrollees in 24-hour coverage and 20 non-enrollees); 3 firms voluntarily provided more names, and we contacted all employees whose names were supplied by those firms. In two firms, employers would not supply the phone numbers, but allowed us to solicit employee participation in the survey through a mailing we sent to employees. Employer willingness to participate in the survey was most difficult among small firms, who objected to us contacting their employees regarding any aspect of workers' compensation. Our sample design should produce internal validity, but due to the self-selected nature of the 65 firms in the original pilot program and the 9 firms in our survey, our results may have limited external validity.

The survey instrument drew mostly from previously developed instruments and measures. For example, the survey included the Short-Form-36 that includes the following subscales: physical functioning, role functioning-physical, general health perception, energy, social functioning, and role functioning-emotional, emotional well-being. The survey also included a work functioning subscale specifically developed for this project. Some of the concepts from the work functioning subscale were drawn from well-established measures in the field, measuring employee job satisfaction, of self-efficacy, of injury propensity, etc. In addition, the survey collected demographic variables such as age, gender, race/ethnicity, income, marital status, and family size.

ENROLLMENT SURVEY SAMPLE OVERVIEW

The final survey sample included 448 respondents out of 670 employees contacted. Slightly more than half (54.2%) participated in pilot program (Table 3.1). About 90% of the respondents were still working for the same employer while they were enrolled in the 24-hour coverage pilot project. The sample was predominantly female (73.4%), in contrast to many workers' compensation studies that are predominantly male. The sample was also slightly older. More than three-quarters of the sample were between the ages of 40 and 59 years old (67.5%), and the majority were non-Hispanic white (64.7%). These characteristics reflect the fact the firms participating in the pilot program and the survey were predominantly state and local government agencies, which are more likely to have an older, female workforce, and are thus not representative of the state's overall workforce.

Overall the respondents were mostly comprised of high school graduates (88.4%) and more than half were married or living with someone (67.6%). Nearly half of the survey respondents had family per capita income of less than \$25,000 (49.1%). The group was well insured, as expected, with nearly all the respondents reporting they received health insurance through their employer (94.2%). Although employers had to offer insurance to their employees to participate in the pilot, they were not required to have a 100% take-up rate.

COMPARING 24-HOUR COVERAGE ENROLLEES TO NON-ENROLLEES

Employees 30-39 years old were less likely to enroll in 24-hour coverage ($p < 0.05$), while those 50-59 years old ($p < 0.05$) were more likely to enroll (Table 3.2). Non-Hispanic whites were more likely to enroll ($p < 0.01$), and Asians and Pacific Islanders were less likely to enroll ($p < 0.001$). Other ethnic minorities were also less likely to enroll, although the findings were not statistically significant for other groups.

Several factors related to employee perceptions and employment conditions were associated with increased participation in the 24-hour pilot. Those who perceived greater risk on the job were less likely to enroll ($p < 0.05$), while those who were satisfied with their pay were more likely to enroll ($p < 0.05$). Employees whose employers provided health insurance were more likely to enroll ($p < 0.05$), as were employees that believed their employers were providing a safe working environment ($p < 0.05$) and accommodating special employee needs ($p < 0.01$).

Employees who indicated their perceived health status as fair or poor were less likely to enroll ($p < 0.05$). However, those who indicated they were satisfied with their general health care were more

likely to enroll ($p < 0.01$). This is particularly relevant because employees enrolling in 24-hour coverage were selecting the same general health plan (i.e., Kaiser) for their workers' compensation care, so their satisfaction with their general health care would seem to be a highly important determinant.

Occupation also was associated with choice of 24-hour coverage. Employees who identified themselves as management were less likely to enroll ($p < 0.05$), as were employees who identified themselves as other professionals ($p < 0.01$). These results are consistent with the perception in California that Kaiser is more likely to enroll blue collar employees.

REASONS FOR ENROLLING IN 24-HOUR COVERAGE

During the telephone interview, respondents were asked why they decided to join or declined to join the 24-hour coverage pilot program. The respondents were given a number of reasons, and were asked if each reason was a major reason, a minor reason, or not a reason in their decision. Respondents who joined were asked a slightly different set of questions than those who declined to join.

Among the 243 respondents who enrolled (Table 3.3), nearly all the respondents said one major reason for joining was that they already belonged to Kaiser for their general health benefits (89.7 percent). The next set of major reasons focused on issues such as convenience and quality. For example, a vast majority (73.7%) said they liked having their needs taken care of in one place, and a majority also said they enrolled because the location was convenient (53.9%). About two-thirds said they enrolled in 24-hour coverage because Kaiser provides good care (63.0%).

The marketing of Kaiser's 24-hour coverage (Kaiser on the Job, or KOJ) appeared to play an important role in the decision of employees who decided to enroll. Almost half (43.2%) said they selected Kaiser on the Job because they liked what they learned about the plan. Slightly more than one-fourth of those enrolled (26.3%) said they joined because they wanted to choose their provider.

Surprisingly, more than one-quarter (25.1%) said that the major reason why they joined was that they were automatically enrolled, despite the fact that enrollment in KOJ was voluntary. This may indicate the need in the future for an educational intervention to inform workers' regarding their enrollment rights, particularly in smaller firms. Finally, a smaller group said they selected KOJ because their employer (14.0%) or friend (5.8%) recommended KOJ, respectively.

Respondents who did not enroll in 24-hour coverage did not appear to have equally strong feelings about their decision. Of the 205 who were not enrolled in KOJ (Table 3.4), almost half (42.0%) could not give reasons for not enrolling because they had not heard of KOJ. Among those who did know of KOJ, the most common reason given for not enrolling (48.8%) was that there was no special reason to join.

Nearly a third of the respondents (30.6%) said they thought it was inconvenient to change from their traditional indemnity workers' compensation to managed care. Still fewer (26.5%) said they simply did not care about choosing. The rest of the major reasons focused on the respondents' negative views toward Kaiser in particular and HMOs in general. For example, some (16.5%) said they did not like what they learned about the plan. Slightly fewer said they did not want to join an HMO (14.8%) or

Kaiser (13.7%). About the same proportion (13.2%) said they had heard bad things about the plan or they had heard that people were unhappy. Finally, a small number (7.4%) said a major reason was that a friend recommended against the plan.

MULTIVARIATE ANALYSIS OF FACTORS DETERMINING ENROLLMENT

After exploring each of the above variables in a bivariate analysis, we ran a logistic regression to identify which factors were most strongly associated with the decision to enroll, holding other factors constant (Table 3.5). This analysis examined the effects of demographic characteristics, the respondent's health status and recent health care experience, perceived risk, employee perceptions of employer attitudes, employee job satisfaction, selected chronic medical conditions, and occupational categories on an employee's decision to enroll in 24-hour coverage. Because of the lack of research on determinants of employee choice in workers' compensation, we view our model as exploratory. Nevertheless, we assumed that employee perceptions of employer attitudes and employee job satisfaction were likely to be positively correlated with the decision to enroll in 24-hour coverage.

The following independent variables were statistically significant: age, race/ethnicity (Asian Pacific Islanders), employee's perceived risk on the job, employee's satisfaction with pay, other chronic medical conditions, and the employee's occupation category (other professions). The employee's probability of enrolling increased slightly with age (OR=1.034, $p<0.05$). In contrast, if the respondent identified himself or herself as Asian Pacific Islander, they were less than half as likely to enroll (OR=0.443, $p<0.05$).

If the employee perceived their job as risky, they were considerably less likely to enroll (OR=0.555, $p<0.05$). But if the employee reported that they were satisfied with their pay, they were nearly twice as likely to enroll (OR=1.927, $p<0.05$). Thus, if the employee perceives their work as risky, they may want to preserve their options with regard to health care. On the other hand, those who feel they are well paid may also perceive a reduced risk of injury on the job, and thus are more willing to accept limitations on their options in the event that they have a workers' compensation claim.

Finally, respondents with other chronic medical conditions were more likely to enroll (OR=1.764, $p<0.05$), and employees identifying their occupational category as other professional were less likely to enroll (OR=0.486, $p<0.05$).

CONCLUSIONS

In general, respondents who were older, satisfied with their pay, or had a chronic medical condition were more likely to enroll in 24-hour coverage. However, those who were a minority (Asian Pacific Islander), perceived their job as risky, or described themselves as "other" professionals were less likely to enroll. Combined with the findings from the descriptive analysis, it appears that if employees knew about Kaiser from other experiences and they felt satisfied with their pay, they were more inclined to accept managed care for workers' compensation. But if they perceived their work as risky, they were less likely to forfeit their eventual choice of provider in the event of a workers' compensation claim.

As noted earlier, the issue of employee trust has been cited as an important issue in determining whether employees report workers' compensation injuries. Our findings indicate that controlling for a variety of factors that might influence employee choice of a managed care workers' compensation program, employees who perceive their work as risky were less inclined to participate in 24-hour coverage, possibly because they feel they might have need for specialized workers' compensation services. If employees who have been injured or who work in conditions in which injury is more common have a more adversarial relationship with their employer, they may be less likely to trust their employer in general and thus less likely to choose a managed care option for workers' compensation. Our results suggest that when employees have a choice of enrolling in managed care for workers' compensation that adverse selection is likely to occur in the indemnity market, because employees with the highest probability of work-related injuries are less likely to enroll in managed care.

Another interpretation of our results is that employers wishing to enroll their employees in the managed care workers' compensation programs must do more to market the favorable aspects of managed care option to employees. As seen in the Johns Hopkins pilot project, if employees feel that their managed care option will provide them with excellent care on a timely basis, they may be more inclined to participate in a managed care option.

There are several key limitations of our study. Perhaps the most important is evident in the reasons for enrolling in KOJ. A number of respondents indicated that a major reason for their enrollment was that they were automatically enrolled by their employer, despite the fact that enrollment was supposed to be voluntary. Interviews with some of the participating firms indicated that managers did not always give employees a choice of enrolling in the managed care option, particularly in smaller companies. Another major limitation is the lack of generalizability of the 65 firms originally participating in the 24-hour pilot program, or the 9 firms agreeing to participate in our employee enrollment survey. Firms participating in the pilot program were more likely to be local and state government agencies, and more likely to be large employers with 500 or more employees. Finally, our study focuses on one particular managed care option, which integrates group health and workers' compensation, offered by one closed-panel HMO (Kaiser). Therefore, our results may not be generalizable to other forms of workers' compensation managed care, which are more frequently based on PPOs. Nevertheless, our results have face validity and provide valuable insight into factors that influence employee choice of workers' compensation managed care.

As discussed in one recent report on workers' compensation, the pendulum appears to be swinging away from implementing new types of medical cost containment initiative toward a period of consolidation and evaluation of "what works" (WCRI, 1998). Managed care may address some of the cost drivers in workers' compensation, but not all. If managed care is to be successful in workers' compensation, it will need to adopt a broader perspective, including prevention and safety promotion, rather than simply attempting to control the price and utilization of medical services (Daiker, 1995).

Our findings highlight employee trust as a critical variable in employee choice. Echoing some of the findings from the state of Washington's pilot project, approaches for improving worker satisfaction must be developed to make managed care feasible for workers' compensation (Reville and Escarce, 1999). Perhaps further research is needed to determine how employers can improve their relationship with

employees to enhance not only the success of managed care in workers' compensation, but better safety and productivity overall.

Table 3.1. Demographic Characteristics of the Enrollment Survey Sample (n=448).

Demographic Characteristics	Frequency	Percent
Gender		
Male	119	26.6
Women	329	73.4
Age		
24-29 Years	24	5.3
30-39 Years	84	18.7
40-49 Years	170	37.9
50-59 Years	133	29.6
60 and older	36	7.5
Missing	1	<0.1
Race/Ethnicity		
Non-Hispanic White ¹	290	64.7
African American	56	12.5
Native American	4	0.9
Latino	46	10.3
Asian Pacific Islander	52	11.6
Education		
High School Graduate	387	88.4
Did not graduate from high school	61	11.6
Marital Status		
Married or living together	301	67.6
Single	144	32.4
Per Capita Income		
\$15,000 or less	78	17.4
\$15,001 - \$25,000	142	31.7
\$25,001 - \$35,000	63	14.1
\$35,001 - \$50,000	108	24.1
More than \$50,000	57	12.6
Health Insurance Status		
Has health insurance through employer	422	94.2
No health insurance	26	5.8
Enrollment in 24-hour Coverage		
Enrolled in Kaiser on the Job	243	54.2
Did not enroll in Kaiser on the Job	205	45.8

¹Includes Other/Refused

Totals may not equal 100 due to rounding error.

Table 3.2. Comparison of Enrollees and Non-Enrollees in 24-Hour Coverage.

	Percent Enrolled (n=243)	Percent Not Enrolled (n=205)
Age		
24-29	4.5	6.8
30-39	14.8*	23.4
40-49	37.9	38.1
50-59	34.2*	24.4
60-plus	8.6	7.3
Gender		
Male	27.6	25.4
Education		
High School Graduate	84.8	88.3
Race/Ethnicity		
Non-Hispanic White	70.4**	58.0
African American	11.5	13.7
Latino	9.9	10.7
Asian or Pacific Islander	7.0**	17.1
Native American	1.2	0.5
Marital Status		
Married or living together	70.8	63.9
Adequacy of Income		
Income meets family's needs	71.5	75.5
Per Capita Income		
less than \$15,000	16.9	18.1
\$15,001 - \$25,000	32.1	31.2
\$25,001-\$35,000	16.9	10.7
\$35,001-\$50,000	22.2	26.4
\$50,001-plus	11.9	13.6
Employee Attitudes		
Perception of risk at job	19.4*	28.3
Satisfaction with pay	79.2*	69.1
Satisfaction with working conditions	84.0	79.5
Satisfaction with job duties	90.9	87.3
Satisfaction with supervisor	84.7	77.8
Employer offers health insurance	96.3*	91.7

* p<0.05, ** p<0.01

Table 3.2. Comparison of Enrollees and Non-Enrollees in 24-Hour Coverage (cont.)

	Percent Enrolled (n=243)	Percent Not Enrolled (n=205)
Employee Perceptions of Employer		
Concerned about health and welfare	81.9	74.5
Provides safe working environment	91.0*	84.9
Is fair to respondent	85.7	81.3
Has a good benefits package	91.3	88.1
Accommodates special employee needs	88.7**	79.1
Respondent Health Status		
Reports fair or poor health status	7.0*	12.7
Forced to limit moderate activities	5.4	10.2
Has to limit climbing stairs	5.8	9.8
Has depression	18.2	19.0
Has neck or back pain	50.4	53.7
Has carpal tunnel syndrome	20.0	22.3
Has other chronic medical conditions	46.5	38.1
Respondent's Health Experiences		
Prefers primary care physician to make decision (compared to self)	58.8	65.0
In last 12 months, spent one night in the hospital	4.1	8.3
In last 12 months, had one doctor's office visit	88.0	86.8
Satisfied with care	94.9**	86.0
Had a work-related injury	40.1	48.3
Occupational Categories		
Management	29.6*	20.5
Health provider	25.5	29.8
Other professional	12.4**	21.9
Clerical	25.1	22.4
Blue-collar	7.4	5.4

* p<0.05, ** p<0.01

Table 3.3. Reasons for Enrolling in 24-Hour Coverage (n=243).

Reason	Frequency	Percent indicating reason was a major reason
Already a member of Kaiser	218	89.7
Needs taken care of in one place	179	73.7
Kaiser provides good care	153	63.0
Location was convenient	131	53.9
Liked what learned about plan	105	43.2
Some other reasons	69	28.4
Wanted to choose provider	64	26.3
Automatically enrolled	61	25.1
Employer recommended plan	34	14.0
Friend recommended plan	14	5.8

Table 3.4. Reasons for Not Enrolling in 24-Hour Coverage (n=121).

Reason	Frequency	Percent indicating reason was a major reason
No special reason to join Kaiser on the Job	59	48.8
Never heard of Kaiser on the Job	86	42.0*
Inconvenient to change	37	30.6
Did not care about choosing	32	26.5
Didn't like what learned about the plan	20	16.5
Did not want to join a HMO	18	14.8
Did not want to join Kaiser	28	13.7*
Heard bad things about the plan	16	13.2
Heard people were unhappy	16	13.2
Friend recommended against the plan	9	7.4

Table 3.5. Logistic Regression Predicting Enrollment in 24-Hour Coverage.

Independent Variables	Parameter estimate	p-value	OddsRatio/95 Percent Confidence Interval
Demographic Characteristics			
Age	0.0336	0.0114	1.034 (1.008-1.061)
Male	0.1586	0.5711	1.172 (0.677-2.029)
High School Graduate	-0.0261	0.9440	0.974 (0.470-2.020)
Race/Ethnicity			
Non-Hispanic White (ref group)	*****	*****	*****
African American	-0.3690	0.3054	0.691 (0.341-1.400)
Native American	-0.5334	0.6845	0.587 (0.045-7.688)
Latino	-0.4661	0.2203	0.627 (0.298-1.322)
Asian Pacific Islander	-0.8141	0.0450	0.443 (0.200-0.982)
Other Demographics			
Married or living together	0.1639	0.5218	1.178 (0.714-1.945)
Family income "meets needs"	-0.3025	0.2856	0.739 (0.424-1.288)
Estimated per capita income	-0.0451	0.6357	0.956 (0.793-1.152)
Health Experience			
Prefers that primary care provider chooses specialist	0.1215	0.6097	1.129 (0.708-1.800)
Employer provides health insurance	0.4895	0.3562	1.632 (0.577-4.616)
In the past 12 months, spent night in a hospital	-0.7737	0.1204	0.461 (0.174-1.225)
In the past 12 months, visited the doctor's office, clinic, or ER	-0.1271	0.7299	0.881 (0.428-1.813)
Satisfaction with health care	0.6558	0.1322	2.071 (0.803-5.345)

Table 3.5. Logistic Regression Predicting Enrollment in 24-Hour Coverage (cont.)

Independent Variables	Parameter estimate	p-value	OddsRatio/95 Percent Confidence Interval
Employee Risk on the Job			
Perception of overall risk at job	-0.5885	0.0496	0.555 (0.309-0.999)
Employee Health Status			
Health status	-0.4290	0.2873	0.619 (0.256-1.497)
Forced to limit moderate activities	-0.6485	0.1752	0.523 (0.205-1.335)
Limit climbing stairs	-0.7396	0.1343	0.477 (0.181-1.257)
Employee Satisfaction			
Satisfaction with pay	0.6558	0.0182	1.927 (1.118-3.320)
Satisfaction with working conditions	0.0115	0.9715	1.012 (0.537-1.906)
Satisfaction with job duties	0.2638	0.5062	1.302 (0.598-2.834)
Satisfaction with supervisor	0.2079	0.5221	1.231 (0.651-2.327)
Perception of Employer Attitudes			
Concerned about health and welfare	0.0143	0.9677	1.014 (0.508-2.027)
Provides safe working environment	-0.0143	0.9677	0.978 (0.423-2.257)
Is fair to respondent	-0.7044	0.0656	0.494 (0.234-1.046)
Has a good benefits package	-0.1543	0.7052	0.857 (0.385-1.906)
Accommodates special employee needs	0.4587	0.2289	1.582 (0.749-3.340)
Employee Injury History			
Ever had a work-related injury	-0.2231	0.3786	0.800 (0.487-1.315)

Table 3.5. Logistic Regression Predicting Enrollment in 24-Hour Coverage (cont.)

Independent Variables	Parameter estimate	p-value	Odds Ratio/95 Percent Confidence Interval
Chronic Medical Conditions			
Depression	0.0512	0.8728	1.053 (0.562-1.970)
Neck or back pain	0.0251	0.9179	1.025 (0.637-1.652)
Carpal tunnel syndrome	0.1533	0.6095	1.166 (0.647-2.099)
Other chronic medical conditions	0.5677	0.0317	1.764 (1.051-2.962)
Occupational Categories			
Management position (reference group)	*****	*****	****
Health provider	0.0661	0.8432	1.068 (0.555-2.057)
Other professional	-0.7219	0.0482	0.486 (0.237-0.994)
Clerical	0.1120	0.7440	1.118 (0.571-2.190)
Service industry	1.0344	0.2118	3.813 (0.555-14.267)
Blue-collar industry	-0.4511	0.4955	0.637 (0.174-2.331)
Chi-square	0.0040		
Hosmer-Lemeshow goodness of fit	0.7773		
Area under ROC Curve	0.7210		

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