Reserving Issues for Workers Compensation Managed Care
by Susan E. Witcraft, FCAS

Reserving Issues for Workers Compensation Managed Care

by Susan E. Witcraft

Abstract

Managed care is becoming an integral part of workers compensation claims management. Some techniques are being implemented internally by insurers, whereas other services are being provided by outside vendors. As part of the introduction of managed care, insurers are beginning to use compensation arrangements with medical providers and managed care networks other than the traditional fee-for-service basis of reimbursement. One such alternative is capitation under which the insurer pays a fixed fee to a provider or provider network in exchange for defined medical services. Under some agreements, only selected types of medical services are covered; under other arrangements, medical services provided in specified time periods are covered. In essence, the insurer is "reinsuring" the covered medical services with the provider group.

The widespread use of managed care techniques is expected to affect claim costs and payment patterns. In addition, because many managed care contracts are financed by a single up-front payment and the insurer may not receive detailed medical payment data, traditional actuarial methods of projecting ultimate medical losses must be adapted. In this paper, the reserving issues that result from managed care and from the various financial arrangements will be identified and approaches for addressing them will be presented.

Biography

Susan is a Consulting Actuary with the Minneapolis office of Milliman & Robertson, Inc. She has managed a property and casualty practice in the Minneapolis office since 1988 after several years in each of M&R's San Francisco and Los Angeles offices. Susan is a Fellow of the Casualty Actuarial Society and a Member of the American Academy of Actuaries.

Susan has advised insurance companies, self-insurance programs, managed care organizations, and regulatory and governmental agencies on a wide range of property-casualty issues, including reserving, ratemaking and product design. In the past several years, she has consulted extensively on the development, implementation and evaluation of workers' compensation managed care programs. She has also worked with clients in the design and pricing of workers' compensation managed care and 24-hour products.

Reserving Issues for Workers Compensation Managed Care

Introduction

Managed care has been an integral component of group health insurance since the 1970s, but it was only in the early 1990s that these techniques were formally introduced to workers compensation insurance. Today, managed care for workers compensation commonly includes some or all of the following features:

- Case management, including both control of medical costs and early return to work.

- Access to an existing provider network.

- Review of bills for reasonableness of charges and appropriateness of procedures.

- Pre-certification of certain treatments, such as surgery, hospitalization, and physical therapy.

Many of these managed care services are provided by outside vendors, though workers compensation insurers are beginning to perform many of these functions internally. It should be noted that, while insurers may be able to develop the expertise to perform the case management and review functions, there are few circumstances in which an insurer will be as effective as group health networks in the network-related functions. That is, because group health networks control a much larger volume of medical services, they have more leverage with providers with regard to negotiation of fee discounts, compliance with treatment guidelines and selection of providers for inclusion in the network. Thus, even many large workers' compensation insurers may continue to purchase at least some of these services externally while small insurers will likely contract out most of these services, at least in the near term.

Compensation of managed care vendors runs a full gamut from essentially risk-free (payment by the insurer for administrative fees for each service plus all medical costs) to highly risky, as in the case of multi-year capitation of all medical. For the purposes of this paper, workers' compensation managed care compensation plans are divided into fee-for-service and capitation.

275

- Fee for service agreements generally include the aforementioned services with fees charged per unit of service, per claim, as a percent of premium (or other exposure base) and/or per employee per month. Under contingent fee for service arrangements, the vendor also receives or pays contingent compensation based on estimated savings and/or selected performance measures.

- With limited capitation of medical services, a defined set of medical services are provided by the managed care vendor on a fixed fee basis. The covered medical services could be limited based on time (e.g., treatment date within so many years of injury date), the cost per injury or the covered services (e.g., pharmacy, physical therapy or primary care physician). Under full capitation of medical services, the workers compensation insurer transfers the full medical risk to the managed care vendor. Contingent compensation based on indemnity savings or other measures of medical performance can also contribute to the total fees paid to the managed care vendor.

Managed care itself, as well as the different types of compensation arrangements, raise many actuarial issues for workers compensation insurers. This paper will focus on loss reserving considerations. Of course, any issues presented by managed care related to the loss reserving process will similarly affect rate level analyses, as loss reserving forms the foundation of the actuarial ratemaking process. These considerations will be identified and insights regarding possible approaches for their resolution will be provided.

Managed Care and Loss Reserving

The goal of managed care is to reduce claim costs through more focused use of medical services and earlier return to work. It has been hypothesized that certain changes will occur in the average cost and timing of medical and indemnity payments as the result of managed care. Some of these hypotheses are contradictory and will only be resolved when managed care has been applied to a sufficient volume of workers compensation losses for a long enough period of time to allow comparison of results with non-managed care experience. These hypotheses include:

- Changes in the average medical cost per claim. A reduction is expected if medical services are provided more efficiently. An increase in the medical average cost per claim could result if the cost of increased medical

276

intervention is expected to be more than offset by savings in indemnity benefits.

- A change in the medical payment pattern. Medical payments could accelerate as case managers focus on decreasing the time between treatments to reduce disability duration and, possibly, as increased medical intervention is used to accelerate recovery and return-to-work. Medical and possibly indemnity payments could be extended, particularly under capitation arrangements under which vendors have incentives to minimize and therefore delay medical treatments. Studies performed at successive evaluation dates have generally shown that estimates of medical savings are relatively stable across evaluation dates. From these findings, it can be inferred that medical payment patterns (at least at early maturities) have not changed in the presence of managed care.

- A change in the average indemnity cost per claim. If the percentage of claimants receiving indemnity benefits is reduced, the average cost of indemnity per claim with indemnity could decrease or increase. That is, if small indemnity claims become medical-only claims, the average cost of the remaining larger claims may be greater than the pre-managed care average cost. The average indemnity cost over all claims is expected to decrease.

- Shortening of the payment rate on indemnity claims with temporary benefits. The change in the payment rate for all indemnity benefits will depend on whether the amount of permanent partial and permanent total benefits decreases by more or less than the decrease in benefits paid on temporary disability claims.

As a result of these anticipated changes, the introduction of managed care may lead to distortions in most of the common actuarial methods, specifically any methods that rely on development or average claim cost projections either directly or implicitly.

277

Average Claim Cost Projections

When applying methods that rely on average claim costs, actuaries will need to make explicit assumptions regarding the impact of managed care on claims cost trends. For example, when projecting the average claim cost for a book of business for which all claims are newly treated with managed care techniques, the actuary will need to make assumptions regarding the percentage reductions in both medical and indemnity costs as well as whether managed care will affect the rate of increase in medical costs (i.e., the trend rate) over time. If only a portion of the claims are treated with managed care techniques, the actuary will need to reflect the penetration of managed care by either analyzing the experience of in-program and out-of-program claims separately or adjusting the average claim cost assumption for both the expected reduction in claim costs and the percentage of claims subject to managed care.

Preliminary analyses of managed care show reductions in both medical and indemnity claim costs in the range of 10% to 30%, with the findings of many studies at the lower end of the range. One study which reviewed claims from two successive policy years shows a very preliminary indication that managed care has not slowed the rate of trend in workers compensation benefits. That is, the study showed approximately the same percentage savings in claim costs in the second year of the program as in the first year of the program at the same maturity using pre-managed care claim cost trends to set the benchmarks.

To illustrate these concepts, assume the following ultimate average claim costs have been projected for losses before managed care was introduced:

Accident Year	Projected Ultimate Average Cost
1989	$ 7,000
1990	7,800
1991	8,300
1992	9,200
1993	10,000

From this experience, we might conclude that average claim costs are increasing at 9% per annum. Further assume that 25% of Accident Year 1994 claims, 50% of Accident Year 1995 and 100% of

278

Accident Year 1996 claims are in managed care. It would then be inappropriate to assume that the average claim costs for Accident Years 1994 through 1996 would exhibit a continuation of the 9% claim cost trend. If we assume that managed care only affects the level of claim costs and not claim cost inflation and that the impact is a 15% reduction in combined medical and indemnity costs, the following approach would provide better estimates of average claim costs than simply applying the 9% per annum trend, or even a judgmentally lowered trend factor.

	(1)	(2)	(3)	(4)
				Projected
		Claim Cost		Average Claim
	Claim Cost on	Trend in	Percent of	Cost
	Accident Year	Absence of	Claims in	(1)x(2)x
Accident Year	1994 Level	Managed Care	Managed Care	[1-0.15x(3)]
1994	$10,900	1.00	25%	$10,491
1995	10,900	1.09	50%	10,990
1996	10,900	1.19	100%	11,025

If average claim costs had exhibited this pattern and the actuary had been unaware that managed care had been phased in over the three-year time period, the actuary would have made erroneous assumptions regarding future trend rates. In addition, ultimate losses would have been overstated for these accident years before sufficient information had emerged regarding average claim costs to identify that losses were less than might be expected based on historical trend rates and average claim costs.

Paid Development Methods

Paid loss development methods are reliant on the assumption that the underlying payment pattern is relatively consistent over time. Under the hypotheses identified in the introduction, this assumption becomes suspect. For medical, the actuary will need to review data to evaluate whether a shift in the timing of medical treatments has occurred. Such shifts could occur from one or a combination of the following sources:

- Accelerated medical treatment in an effort to enhance faster return to work.

- Slower medical treatment as part of medical cost containment efforts.

- A reduction or increase in active medical treatment early in the life of claims followed by medical maintenance costs that are similar to historical levels. If active medical treatment is reduced, the paid loss development factors will increase; if early medical costs increase, the paid development factors will decline.

To test the impact of the timing of managed care on medical treatments, the actuary can review statistics regarding the time lag between medical visits. Comparisons of the dollar amount of medical payments per claim for in and out of managed care claimants within the first two to three years after date of injury will also assist in evaluating whether and what adjustments are needed to paid loss development factors because of a possible mix in medical payments between active medical treatment and maintenance costs.

For indemnity, reduced temporary total durations are likely to be the primary source of expected savings. If temporary benefits are reduced with no change in permanent total and permanent partial payment patterns or benefits, the combined payment pattern will likely lengthen, though the result is also dependent on the extent to which temporary total benefits are reduced. The following example illustrates this result. Assume the following:

- Temporary total indemnity benefits are paid on the same percentage of claims as before managed care, but for a 20% shorter duration on average. The impact on the temporary total payment pattern is to reduce payments in the first year by 10%, the second year by 20%, the third year by 30% and the fourth year by 40%.

- Fatal, permanent partial and permanent total indemnity benefits are unaffected by managed care.

- Temporary total benefits make up 30% of indemnity benefits.

- The historical payment patterns for temporary total and other indemnity benefits are as shown in the table below.

280

Year of Payment	Temporary Total	Other Indemnity	Combined
Accident Year	40%	5%	15.4%
Accident Year + 1	70%	27%	40.0%
Accident Year + 2	90%	43%	57.1%
Accident Year + 3	100%	54%	67.6%
Accident Year + 4	100%	63%	74.1%

Under these assumptions, temporary total benefits would become 25.5% (= 30% x 0.8 / [30% x 0.8 + 70%]) of total indemnity, with other benefits increasing as a percentage of total indemnity benefits to 74.5%. The adjusted temporary total and total indemnity benefit payment patterns are shown below.

Year of Payment	Temporary Total	All Indemnity
Accident Year	45%	15.1%
Accident Year +1	75%	39.3%
Accident Year + 2	93%	55.8%
Accident Year + 3	100%	65.5%
Accident Year + 4	100%	72.4%

Having derived these adjusted payment patterns, we can adjust the paid loss development factors that we would otherwise use in the paid loss development and paid Bornhuetter-Ferguson methods. The table below shows the paid loss development factors from the above example before and after adjustment.

Maturity	Before Managed Care	After Managed Care
12 Months	6.49	6.62
24 Months	2.50	2.54
36 Months	1.75	1.79

281

Maturity	Before Managed Care	After Managed Care
48 Months	1.48	1.53
60 Months	1.35	1.38

As can be seen, the indemnity development factors before managed care understate development by 2% to 3%. The faster rate of temporary total payments is more than offset by the reduction in temporary total as a proportion of total indemnity, thereby lengthening the combined payment pattern. Of course, the adjustments made to the development factors are highly dependent on the assumptions made regarding the amount and timing of the impact of managed care on benefits.

Fee-For-Service Arrangements and Loss Reserving

Fee-for-service arrangements are expected to affect the loss reserving process in the same manner as managed care programs in general, as described in the previous section. Fee-for-service arrangements will also require the actuary to estimate a reserve for unpaid loss adjustment expenses relating to managed care services that have yet to be provided. Under the 1994 NAIC accounting changes, a reserve must be established for the estimated cost of these services, regardless of whether or not they have been prepaid.

The services that are likely to extend past the end of each accident year, and therefore require that a reserve be established, are medical case management, bill review and network access. Medical case management could be provided on claims until the injured worker has returned to work or has been declared permanent total, but will generally be weighted heavily to the first nine to twelve months after injury date. Using information about the likely duration of medical case management that can be obtained from the managed care vendor or insurer and the reporting pattern of claims, the actuary can develop a model to estimate the proportion of medical case management yet to be provided at the evaluation date of the reserve analysis. A reserve could be established either using an estimate of the number of hours remaining and an average hourly cost or by allocating the total fees among services and multiplying the estimated fees for medical case management by the percentage of services yet to be provided.

The timing of bill review services and network access and therefore payment of the corresponding fees are likely to be similar to medical payments. In the case of bill review, this hypothesis assumes

that the charges per bill do not vary significantly over the life of a claim as most of these services are provided on a fee-per-bill basis. The actuary will need to understand the time period over which bill review and network access are expected to be provided and whether all bills will be reviewed and all services provided through the network. For example, some bill review excludes hospitalization. Other vendors may include only provider bills and therefore not cover many of the services provided for so-called medical maintenance costs. These considerations will affect the model that the actuary uses to estimate a reserve for bill review and network access fees.

To illustrate a possible reserving approach, consider the following assumptions:

- Bill review is estimated to cost 0.5% of premium and is performed on all bills for three years after injury date.

- Network access is estimated to save 10% of medical and the cost is 20% of savings.

- Medical case management is estimated to cost $75 per hour, and is expected to be provided on 10% of claims for an average of 10 hours each.

- 75% of medical case management is estimated to occur within 12 months of injury date, 20% in the next 12 months and 5% in the subsequent 12 months.

The medical case management pattern must first be converted to an accident year basis. Assuming that managed care claims occurred uniformly throughout the accident year, 37.5% of medical case management is provided in the accident year, 47.5% in the next year, 12.5% in the third year and 2.5% in the fourth year. Assume that the medical payment pattern is as shown in the table below.

Year of Payment	Percent Paid
Accident Year	30%
Accident Year + 1	27%
Accident Year + 2	10%
Accident Year + 3	4%
Accident Year + 4+	29%

283

The unallocated loss adjustment expense reserves at 24 months could be calculated as follows:

- Bill review: 0.5% of premium times 17.3% equals 0.09% of premium, where 17.3% is derived as the sum of the 10% of medical payments made in Accident Year + 2 and half of the 4% of medical payments made in Accident Year + 3 divided by the approximately 69% of medical payments made within three years after injury date (the average of payments through Accident Year + 2 and Accident Year + 3).

- Network savings: the fee of 10% of savings times savings of 20% of medical times unpaid medical at 24 months of 43% equals 0.86% of estimated ultimate medical.

- Medical case management: 10% of claims times 10 hours per claim times $75 per hour times 15% unpaid or $11.25 per ultimate reported claim.

Thus, the unallocated loss adjustment expense reserve for managed care fees would be 0.09% of premium plus 0.86% of estimated ultimate medical plus $11.25 per ultimate reported claim.

Reserving in the Presence of Capitation

There are two situations that the actuary may face in the presence of a medical capitation:

1. In the first situation, the managed care vendor will report medical payments (either the dollar amount paid by the vendor, the amount paid at the workers compensation fee schedule or a summary of the number of treatments by type) to the insurance company.

2. In the second situation, the insurance company will not know the types or dollar amount of medical treatment under the capitation.

The first situation is, not surprisingly, easier to address from a reserving perspective. If medical costs are fully capitated, the actuary will be concerned with reserves only on a gross basis. If the capitation is limited, however, the actuary will need to develop reserve estimates net of the capitation.

284

In the situation in which the actuary knows or can estimate the cost of medical treatments under the capitation arrangement based on information regarding specific treatments provided, the reserve analysis can begin in a fairly traditional manner. If the quantity of services is provided, the actuary can estimate the cost using the medical fee schedule or usual and customary fees which are available from a number of sources. If the medical payments provided are those paid by the managed care vendor, the actuary will want to adjust these payments for any differences between the fee schedule used by the managed care vendor and the fees normally paid by the insurer. This adjustment will eliminate any biases in the estimate of ultimate costs if the managed care vendor pays consistently higher or lower fees than the insurer. That is, because the insurer will pay medical after the capitation based on its own fee schedule, it is necessary to restate the medical payments under the capitation to reflect the same fee schedule.

To illustrate, assume that of $1,000,000 reported as paid medical as of 12 months, $250,000 of which was reported by the managed care vendor that is capitating medical for three years after injury date. Also assume that the managed care vendor is reporting medical at its cost and that the insurer generally compensates providers at the statutory fee schedule. By comparing reimbursement rates for a sample of CPT-4 codes, it has been determined that the managed care vendor's cost is about 15% lower than the fee schedule. It would then be appropriate to divide the $250,000 reported by the managed care vendor by 0.85 and add it to the $750,000 paid by the insurer before applying any actuarial methods to paid or incurred losses. Thus, paid medical at 12 months would be adjusted to $1,044,118 from $1,000,000.

The actuary will then need to estimate the proportion or amount of medical losses that are covered by the capitation. For illustration, assume that the data available to the actuary are accident year data developed annually, the capitation covers medical costs for three years after injury date, and it is reasonable to assume uniform injury dates throughout the accident year. In this situation, the actuary can estimate the percentage of medical losses covered by the capitation by assuming that all medical losses paid by 42 months are covered by the capitation. (On claims reported on the first day of the accident year, payments through 36 months are covered, whereas payments through 48 months are covered on claims reported on the last day of the accident year.)

Assume that, from historical medical paid loss development, the selected paid medical development factors in the absence of managed care are those shown in the following table.

Maturity	12	24	36	48	60	72
Paid Development Factor	2.86	1.64	1.43	1.35	1.30	1.25
Percent Paid	35%	61%	70%	74%	77%	80%

From this table, it would be reasonable to estimate that 72% of losses will be paid by the managed care vendor. Using the $1,044,118 of adjusted medical payments at 12 months and the pre-managed care development factor from 12 months to ultimate of 2.86, the paid loss development method would project ultimate medical losses of $2,986,175. Assuming that the other methods used provided similar indications, a selection of $3,000,000 might be made. To eliminate the losses covered by the capitation, the $3,000,000 of ultimate medical would be multiplied by the percent of losses projected to be paid more than three years after injury date of 28% (=100% - 72%) to arrive at an estimate of retained losses of $840,000. The actuary will, of course, need to consider all of the issues raised in the discussion of the impact of managed care on reserving in general.

The use of methods based on case reserves, such as incurred loss development and incurred Bornhuetter-Ferguson, will depend on whether case reserves are established and what liability is recognized in the case reserves. In the above example in which medical payments in the first three years after injury are capitated, several approaches could be used to set case reserves:

1. No case reserves are set until three years after injury date. This situation could occur if the claim administrator does not have complete information regarding the claimant's medical condition during the capitation period.

2. Case reserves are set in the traditional manner in which the reserve reflects the estimated future cost of medical services.

3. Two case reserves are set, one for the portion of costs expected to be paid under the capitation and one for medical treatments estimated to be made more than three years after injury date.

In the first situation, projection of incurred medical losses will be similar to projecting paid losses in the absence of payment data and is addressed in the next section. Under the latter two approaches, traditional actuarial methods can be used to project ultimate incurred losses. If only a single case reserve is set, assumptions need to be made for financial reporting regarding the amount of case reserves that are the liability of the insurer and the amount that will be covered under the capitation.

Under the third approach, the case reserve information can ease financial reporting and allocation of projected costs between parties.

Medical Treatments Unknown

If the actuary does not have any information regarding the medical payments that are being made, an estimate of the medical payments after the end of the capitation must be made directly without reliance on emerged payment experience. Two approaches for estimating those payments will be discussed: one that can be applied while no payment data are available (during the capitation period) and one after the capitation period has ended.

During the capitation period, to estimate the medical payments that will be made after the end of the capitation, the actuary could use the Bornhuetter-Ferguson method with the paid loss development factor adjusted to include only payments after the capitation. That is, the actuary could estimate ultimate medical payments in the absence of managed care using an expected percentage of premium or an ultimate average cost per claim. These assumptions could be extrapolated from pre-managed care experience. The percentage of total medical after the capitation could be estimated from a historically based medical payment pattern. The actuary would want to consider what effects the managed care would have on ultimate average claim costs and on payment patterns. In the presence of a capitation, the hypothesis that medical treatments may be provided slower to reduce total medical expenditures becomes more likely.

To illustrate, assume the following:

- Based on historical experience, medical losses are projected to be 40% of premium in the absence of managed care.

- Managed care is projected to reduce medical losses by 15%, but is assumed not to affect payment patterns (in the absence of information to the contrary).

- The historical medical payment pattern is that used in previous illustrations.

In this situation, with $9 million of earned premium, the Bornhuetter-Ferguson method would project retained medical payments, capitation as follows:

287

(1)	Earned Premium	$9,000,000
(2)	Medical Loss Ratio	40%
(3)	Expected Medical Losses without Managed Care (1)x(2)	$3,600,000
(4)	Estimated Medical Savings	15%
(5)	Expected Medical Losses with Managed Care (3)x[1-(4)]	$3,060,000
(6)	Estimated Percentage Unpaid 3 Years after Injury	28%
(7)	Estimated Retained Medical Costs (5)x(6)	$856,800

The same calculations would be performed at all evaluation dates up to 36 months. That is, the percentage of losses unpaid would be the best estimate for 42 months of maturity, regardless of whether the actual maturity of the accident year were 12 months or 36 months.

Once medical payment data have become available (and presumably the management of medical has been turned over to the insurer who then sets case reserves), the actuary could apply paid and incurred loss development methods. In these applications, the paid and incurred loss development factors would need to be adjusted to exclude payments prior to the capitation.

Continuing the earlier example, we estimated that roughly 72% of medical payments would be eliminated by the capitation. If payments after the capitation up to 60 months are $200,000, then we can estimate ultimate medical payments after the capitation as

$$\frac{\$200,000}{0.77 - 0.72} \; x \; (1 - 0.72) = \$1,120,000,$$

where 77% is the percent of medical losses estimated to be paid at 60 months from the earlier illustration.

Similarly, the same technique can be used for incurred losses. Assume the following regarding development of incurred medical losses:

288

Maturity	12	24	36	48	60	72
Incurred Development Factor	1.65	1.325	1.25	1.225	1.20	1.19
Percent Incurred	60%	75%	80%	82%	83%	84%

Using the same assumptions regarding the medical payment pattern and incurred losses of $300,000 as of 60 months, ultimate medical losses after the capitation would be estimated as

$$\frac{\$300,000}{0.83 - 0.72} \times (1 - 0.72) = \$763,636.$$

The denominator of this formula was derived as follows:

Incurred @ 60 months (with capitation)
= Paid between 42 and 60 months + Case @ 60 months
= Paid between 0 and 60 months + Case @ 60 months - Paid @ 42 months
= Incurred @ 60 months (without capitation) - Paid @ 42 months
= 0.83 - 0.72

Once the capitation period has elapsed, the actuary can also apply the Bornhuetter-Ferguson method in its traditional manner to both paid and incurred losses.

Conclusion

Managed care presents many issues for actuaries. Hypotheses regarding its impact must be selected, emerging experience must be monitored to test these hypotheses and projection methods must be adapted to the changing environment. Until definitive results are available, the presence of managed care will increase the uncertainty surrounding projections of workers' compensation liabilities.