Workers' Compensation Managed Care
Pricing Considerations

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ABSTRACT

Title: WORKERS' COMPENSATION MANAGED CARE PRICING CONSIDERATIONS

Workers' Compensation insurers have instituted significant managed care initiatives over the last 3 to 5 years. Savings can be significant. Due to the potential savings from managed care initiatives, it is important to reflect managed care in pricing workers' compensation products.

The impact of managed care on insurer loss costs may vary dramatically depending on the type of product and the layer of coverage. Managed care will effect primary carries different than excess carries, since a managed care program will likely effect both the:

- Average cost per claim; and

- The distribution of these costs.

This paper briefly describes managed care initiatives including fee discounts, utilization review, case management and capitated arrangements. It also discusses how managed care can be factored into actuarial pricing methodologies for both the primary layer and excess layers.

WORKERS' COMPENSATION MANAGED CARE

PRICING CONSIDERATIONS

Workers' Compensation insurers have instituted significant managed care (MC) initiatives over the last 3 to 5 years. Initial MC studies indicated savings between 7% and 60%[1]. Savings from future MC expansion will probably be far less than 60% because the base period already includes substantial MC activities[2]. Future MC savings can, however, still be significant, with savings of 10% to 15% not uncommon. Due to the potential savings from MC initiatives, it is important to reflect MC in pricing workers' compensation products.

The impact of MC on insurer loss costs may vary dramatically depending on the type of product and the layer of coverage. The early 1990's saw an explosion in the number of high deductible workers' compensation policies offered and sold. With a high deductible policy, the insured is financially responsible for the primary layer of coverage (e.g., the first $500,000 of loss and possibly ALAE) and the insurer is financially responsible only for loss in excess of the primary retention. For high deductible policies, MC will impact the insurer's loss costs differently than MC will impact the primary loss costs or a primary insurer's loss costs.

This paper will:

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[1] See Brian Brown and Melodee Saunders "Recent Trends in Workers' Compensation Coverage", CAS Forum, Summer 1996, page 21.

[2] If claim handlers are simply bill payers and a comprehensive managed care program was introduced to the process, then substantial savings could be achieved. If claim handlers are adeptly performing their duties and applying managed care techniques, then new or enhanced programs will likely have a lesser impact.

- Briefly describe MC initiatives;

- Discuss how MC can be factored into actuarial pricing methodologies for primary layers; and

- Discuss how MC can be factored into pricing excess layers and suggest a method for adjusting excess ratios.

MC INITIATIVES

Some of the more commonly used MC procedures include fee discounts, utilization review, case management and capitated arrangements. These MC procedures will affect large claims and small claims differently. Therefore, excess insurers need to reflect the impact on large claims, while primary insurers will need to reflect the impact on all claims.

1. **Fee Discounts**

   One program that insurers have been using for years to reduce loss costs is fee discounts. Insurers with significant bargaining power are frequently able to negotiate reduced medical fees from a particular medical provider in return for the commitment to channel a large number of injured workers to that provider. Recently, insurers have pursued more aggressive (e.g., larger) discounts. The impact of these discounts varies by the type of claim.

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While all claims receive the discount, the impact may be slightly greater for smaller claims. This is due to the fact that historically, for permanent total claims, insurers were already seeking discounts for lifetime care plans. Therefore, aggressive fee discounts were already being pursued for severe claims. For example, if the fee discount is 10% for all claims, a 15% impact may apply to primary losses but a lower number would apply to excess losses.

2. **Utilization Review (UR)**

Insurers using UR have employees or subcontractors review the procedures and practices of physicians to determine if appropriate medical treatments are being utilized. Proposed medical procedures are evaluated and authorization is given only when deemed medically necessary. The three utilization review techniques most frequently used are concurrent review, retrospective review and pre-admission certification. Concurrent reviews are designed to immediately recognize inappropriate treatment patterns and alter the healthcare services being provided for a worker. This type of review often centers on the length of stay for a hospital admission. Retrospective reviews are designed to detect errors in past treatment. These errors can then be brought to the attention of the providers in an effort to curb inappropriate or excessive care. Pre-admission certifications are used to direct patients away from costly inpatient care to outpatient services when appropriate. UR should impact small and medium size claims to a greater extent than very large claims. For large claims, most insurers were already performing UR type procedures.

3. Case Management

Case management involves a qualified professional (usually a nurse) overseeing the progress of an injured employee to assure appropriate and timely care. Case managers will typically work closely with all parties involved (employees, employer and physicians) to get the injured employee back to work as quickly as possible even if the employee's job duties need to be refined.

Case management is expected to:

- Reduce the overall cost of all claims (except for medical-only and fatalities); and

- Reduce the frequency of large claims (e.g., permanent total) as some workers will return to work quicker than in the past (due to light duty assignments).

Additionally, case management can reduce indemnity costs, as there is an emphasis on return to work.

4. Capitated Arrangements

In a capitated arrangement, the healthcare provider receives a flat fee. In exchange, the healthcare provider agrees to provide appropriate medical services for all injured workers they treat, subject to their contract with the insurer during a certain time period. Typically, claims occurring outside the state are excluded and for catastrophic claims, the medical treatment costs have a predetermined dollar limit.

These arrangements are expected to reduce medical costs. The insurers have essentially transferred much of the predictable expense to a MC organization. This arrangement may effect smaller and medium size claims more than large claims, as medical payments above thresholds are not covered. (For the large claims, once a threshold is exceeded the payment mechanism switches to fee for services.)

PRICING REFLECTING MC – PRIMARY LAYER

In reflecting MC in pricing, it is important to segregate the data subsequent to and prior to MC. For example, assume we are analyzing the following data. The assumption underlying the data is that pure premiums are trending at 6% per year and MC has a one-time impact of 10% in 1996.[3]

Table 1		
Policy Year	Developed Pure Premium	Annual Implied Trend
1993	2.00	
1994	2.12	6.0
1995	2.25	6.0
1996*	2.15	(4.4)
1997	2.28	6.0
1993-97		3.3

* Implemented comprehensive MC program with expected savings equal to 10%

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[3] We have assumed that MC is fully effective on 1/1/96. MC would typically be phased in over a period of time in a state and may take a year or longer to be fully effective. This phase in makes it more difficult to separately estimate the trend and MC effect.

Without appropriately measuring the MC impact, pricing errors could occur. For example, it would be incorrect to simply trend the previous policy years to a 1998 level based on a historical average trend rate of 3.3% and apply a 10% MC discount.

The following table displays this **incorrect** calculation:

Table 2				
(1) **Policy Year**	**(2)** **Developed Pure** **Premium**	**(3)** **Trend to 1998***	**(4)** **Managed Care** **Credit**	**(5)** **Projected 1998** **Pure Premium**
1993	2.00	1.176	0.9	2.12
1994	2.12	1.138	0.9	2.17
1995	2.25	1.102	0.9	2.23
1996	2.15	1.067	0.9	2.06
1997	2.28	1.033	0.9	2.12
Average				2.14

* at 3.3%

In the above example, MC savings are counted twice: the credit from column (4) of the above table, as well as the lower trend rate derived from Table 1, where MC savings are already reflected in policy years 1996 and 1997. To avoid the double counting of savings, we should perform the analysis after removing the one time impact of MC and reflect the MC impact after adjusting the pure premium to a 1998 level:

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Table 3				
Policy Year	Developed Pure Premium	Adjustment to Remove Managed Care	Adjusted Pure Premium	Implied Trend
1993	2.00	1.0	2.00	
1994	2.12	1.0	2.12	6%
1995	2.25	1.0	2.25	6
1996	2.15	1.11	2.39	6
1997	2.28	1.11	2.53	6

The following approach can then be used to calculate the 1998 pure premium:

Table 4					
Policy Year	Adjusted Pure Premium	Trend to 1998	Projected Adjusted* 1998 Pure Premium	Managed Care Credit	Adjusted 1998 Pure Premium
1993	2.00	1.34	2.68	0.9	2.41
1994	2.12	1.26	2.68	0.9	2.41
1995	2.25	1.19	2.68	0.9	2.41
1996	2.39	1.12	2.68	0.9	2.41
1997	2.53	1.06	2.68	0.9	2.41
Average					2.41

* Prior to MC

Thus, the first approach which incorrectly uses experience both before and after MC to determine a trend factor and then applies the 10% MC reduction understates the 1998 pure premium by 11.2% (2.14 from Table 2 versus 2.41 from Table 4). As a note, if the more recent years are relied on more heavily and 2.09 is selected as the projected 1998 pure

premium (average of 1996 and 1997) the understatement is more severe at 13.3% (see Table 2).

Also, if the 0.9 MC adjustment was not made in the first set of calculations (Table 2), the selected pure premium would be 2.38 and would be deficient by about 1.2%. Therefore, in pricing workers' compensation coverage, it is important to identify the MC impacts in the data versus the MC savings that are expected to come in the future.

For example, if an additional MC program will be introduced in 1998 in state X, and based on analyzing state Y data where the program was introduced 2 years ago we observed savings of 5%, then we could reduce the 1998 pure premium by 5% in state X (assuming the same impact in state X as state Y). However, if the program was instituted in state X in 1996 and is already reflected in our ratemaking data, which reflects trending procedures, then it would be incorrect to simply reduce our 1998 indication by 5%.

An added difficulty in performing the above analysis is that different MC initiatives may be introduced at different points in time. Also, the data will not display trends as clearly as this hypothetical data.

There are several ways to measure MC savings. One way is to evaluate claims before the introduction of MC (adjusted to current cost levels) and after the introduction of MC (again

adjusted to current cost level). A simplistic approach may involve measuring average severities (assuming no frequency impact). Using the example above, where MC was introduced in 1996, we may have observed the following severities:

Table 5			
(1) Policy Year	(2) Average Severity	(3) Trend Factor to 1998	(4) Current Cost Level Severity (2)x(3)
1993	2,500	1.34	3,350
1994	2,650	1.26	3,339
1995	2,809	1.19	3,343
1996	2,680	1.12	3,002
1997	2,840	1.06	3,010
(5) Average Severity 1993 – 1995 = 3,344			
(6) Average Severity 1996 – 1997 = 3,006			
(7) Managed Care Impact (1-(6)/(5)) = 10%			

This approach assumes a 6% trend factor affects each year. A more refined approach might vary the trend factor in each calendar year; however, the general framework would be the same.

The above examples are intended to illustrate the interaction between the loss cost trend and MC. To accurately measure MC savings, it is necessary to accurately measure the annual loss costs trend. Measuring the effect of trend separate from MC is difficult. In order to determine the underlying claim cost trend, one needs to make an adjustment for the MC

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impact. Yet in order to determine the MC impact, one needs to know the underlying trend factor so that all years can be adjusted to a comparable basis. Therefore, when measuring the effect of MC separate from trend:

- economic models can be developed;

- individual claim studies can be performed, and/or

- assumptions and judgement must be utilized.

MEASURING MANAGED CARE IMPACTS

The effects of MC can be estimated by using an actuarial, clinical, or claims perspective. Using an actuarial perspective, key aggregate statistics should be reviewed. These statistics should be analyzed before and after the implementation of MC. Some of the statistics include, but are not limited to the following:

- Paid severities;

- Incurred severities;

- Loss ratios;

- Pure premiums;

- Percentage of medical-only claims;

- Claim frequencies;

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- Average days off work; and

- Report lags.

Analysis of average paid and incurred severities is relatively straightforward. Severities with and without MC are analyzed (after being adjusted to current cost and benefit levels) and the reduction in severities is attributable to MC.

Similarly, we could analyze pure premiums or loss ratios (adjusted to current cost levels and for premium credits and debits). As a note, it would be preferable if we could identify MC and non-MC claims in a state during the same time period. This will happen sometimes, for example, if the insured can select MC as an option. If a single time period is used, issues related to claim cost inflation and benefit changes are eliminated.

Many MC initiatives focus on early intervention by case managers. It is believed that if the case manager can impact treatment within a day or two after the injury date, then savings can result. With the case manager's focus on return to work, we would expect more injured workers to return to work within the waiting period (generally three to seven days). Therefore, if the percentage of medical-only claims is increasing it is a sign that MC initiatives are working. We can estimate the MC impact by weighting average severities by type of claim.

Assume we have the following distribution of claims and severity by type of claim:[4]

Table 6		
Type of Claim	**Total Average Cost**	**Distribution of Claims**
Medical-only	625	63.63%
Minor/TT	5,084	32.75
PT/Major	102,784	3.55
Fatal	95,372	0.07
Average	5,778	100.00%

The severities are displayed in a paper by Mr. William R. Gillam and are part of the NCCI excess loss rating methodology. As a note, Mr. Gillam's paper did not include a medical-only severity; therefore, we selected a medical-only severity of $625.

If the medical-only percentage increases from 63.63% to 66.63% due to case manager/early intervention and we expect this to reduce the Minor/TT category from 32.75% to 29.75%, then we would anticipate the average severity to decrease to $5,645 with the new weights (assuming the medical-only severity remains constant). Thus a 3% increase in medical-only claims reduces severities or has a MC impact of 2.4%.

As a note, the above percentage only measures the impact of early intervention. If we estimated that other MC initiatives reduced severity by 10%, then we would estimate a combined MC impact of 1 – (.9)(1 - .024) or 12.2%.

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[4] William R. Gillam, "Retrospective Rating: Excess Loss Factors", FCAS LXXVIII 1991 p.1

Similarly, if we estimated that MC initiatives will get employees back to work quicker, this initiative will affect the distribution of claims by injury type. For example, with light duty assignments and aggressive case management, the percentage of PT/Major claims may decrease with fewer claimants moving from Minor/TT to PT/Major in a MC environment. Therefore, if we assume a 20% decrease in PT/Major claims, the percentage of PT/Major claims decreases from 3.55% to 2.84% while the Minor/TT percentage increases from 32.75% to 33.46%. This decreases the overall severity from $5,778 to $5,085 or approximately 13.6%.

Other statistics which will affect workers' compensation costs are the:

- Number of days off work; and
- Report lags.

As the number of days off work increase, claim costs increase. Therefore, if MC is able to reduce the number of days off work (due to more quickly achieving maximum medical improvement or accelerating the creation of light duty jobs) workers' compensation claim costs will decrease.

Also, decreases in report lags may lead to lower claim costs due to the benefits of early intervention.[5] Therefore, if MC initiatives reduce the report lag, overall claim costs may decrease.

ALTERNATIVE METHODOLOGY

The above mentioned analyses focus on analyzing aggregate claim statistics. Another methodology which measures the impact of MC analyzes individual claim statistics. Under this approach, groups of claims are identified – those in MC and those not treated by MC. It is probably best if both MC and non-MC claims occurred during the same time period; however, this is not essential. The same time period eliminates most, if not all, of the issues related to claim cost inflation and benefit changes. If claims are not from the same time period, the older claims should be adjusted for claim cost inflation and benefit level changes.

In this approach, the total amount of paid loss (or incurred loss if MC does not affect case reserve adequacy) on each claim at a selected maturity (e.g., a study at year-end 1997 might use payments through 24 months for all claims occurring during 1995) is treated as the -dependent variable in a regression equation. Independent variables might include body part, nature of injury, age of the claimant, industry group, employer size and the use/non-use of MC. The MC variable then measures the impact of MC.[6]

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[5] One exception to this statement is that the most severe claims are generally reported very quickly and have a very high claim cost.
[6] The MC variable would be a dummy variable with MC claims having a code of 1 and non-MC a code of 0.

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CLINICAL AND CLAIMS PERSPECTIVE

Insurers' current MC strategies could be analyzed from a clinical perspective and the cost savings quantified. For example, the clinicians could summarize how long employees are out of work or the time duration of medical treatment both with and without the implementation of MC.

MC strategy could also be analyzed from a claims perspective. The claims personnel could quantify the average cost of claims (medical and indemnity separately) with and without the implementation of MC. This study would be based on reviewing individual claim files (most commonly a sample of files). For both the clinical and claims perspective, the analyses should be done by type of claim and MC activity.

PRICING MC – EXCESS LAYERS

We would expect the MC savings impact to vary depending on the:

- Type of the claim; and

- Size of the claim.

This section will discuss some procedures on adjusting the size of loss distributions to account for a MC program.

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For illustrative purposes, we will comment on the size of loss procedure used by the National

Council on Compensation Insurance (NCCI). Mr. William R. Gillam discusses this procedure

in "Retrospective Rating: Excess Loss Factors".[7]

The NCCI procedure combines four different type of claim distributions to estimate excess loss

factors (ELF's). The ELF's are used to estimate the charge for limiting losses at a certain

dollar amount in the Retrospective Rating Manual. The ELF times the standard premium is

the estimated pure loss charge for limiting losses. Thus, if an insurer wrote an excess or a

high deductible policy, multiplying the ELF by the standard premium would represent the

insurer's loss cost for this coverage.

In estimating the combined loss distribution, NCCI evaluates separate curves for the following

claim types:

- Fatalities;

- Permanent total & major permanent partial (PT/Major);

- Minor permanent partial & temporary total (Minor/TT); and

- Medical-only claims.

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[7] William R. Gillam, "Retrospective Rating: Excess Loss Factors", FCAS LXXVIII 1991 p.1

The NCCI procedure develops countrywide distributions and the distributions are adjusted for each state based on the state's:

- Average claim size; and
- Mix of Hazard Group exposure by state.

The distributions normalize the claims so that an entry ratio distribution can be developed.

The following table is extracted from Exhibit 3, Part 1 (Fatality Curve) of Mr. Gillam's paper:

Table 7	
Entry Ratio	**Excess Ratio**
0.25	0.804
0.50	0.659
0.75	0.544
1.00	0.452
1.25	0.377
1.50	0.315

Using entry ratios adjusts the excess ratios for the effect of inflation and for differences by state and hazard group.

The interpretation of the 0.25 entry ratio is that if the statewide average severity for fatalities is 100,000, then:

- We would expect 80.4% of the losses to exceed 25,000 (an entry ratio of 0.25 times 100,000); and

- We would expect 31.5% of the losses to exceed 150,000 (an entry ratio of 1.50).

Since we expect MC to alter the severities by type of claim, we would expect MC to also change the ELF's and excess ratios.

The following outlines a procedure for adjusting the excess ratios for MC. It involves adjusting the severities and injury weights by claim type to derive excess ratios adjusted for MC programs.

Assume we are pricing an insured with expected ultimate losses of $50.0 million and we assume that the ELF tables from Mr. Gillam's paper are appropriate to price this risk.[8] For the convenience of the reader, we have reproduced Mr. Gillam's Exhibit 2 as Exhibit 1 in this paper. We will next outline how we expect MC to change Exhibit 1.

Assume we are pricing an excess or large deductible policy for a risk that retains the first $100,000 of loss.

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[8] We are assuming that the ELF table is appropriate before MC and that MC changes the avergae severity by claim type but not the dispersion of individual claims.

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Underlying Exhibit 1 are the following assumptions:

- Fatal average cost = $95,372;

- PT/Major average cost = $102,784; and

- Minor/TT average cost = $5,084.

To utilize this procedure we first need an estimate of the total severity split between indemnity and medical costs. Let us assume the following:

Table 8			
Type of Claim	Total Average Cost	Medical Component	Indemnity Component
Fatal	$95,372	$19,074	$76,298
PT/Major	102,784	61,670	41,114
Minor/TT	5,084	2,542	2,542

Mr. Gillam did not include medical-only claims. All medical-only claims would most likely be below the deductible and therefore be fully retained by the insured.

Assume that we have measured MC savings in total and by type of loss based on the methods we previously discussed. The savings are as follows[9]:

- Medical savings of 25%; and

- Indemnity savings of 20%.

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[9] We selected significant savings percentages for illustration purposes.

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These overall savings may likely vary by type of claim:[10]

- **Fatalities** – We would expect that MC will have little impact on future fatality costs. MC is unlikely to change the indemnity portion of fatal claims. MC could have some impact on the medical portion of fatal claims. However, if someone is seriously injured and is near death it is unlikely that MC principles would be employed (e.g., the worker would be transported to the nearest hospital and all procedures possible would be undertaken to save the injured worker's life). Therefore, we would not expect MC to change the average cost or distribution of costs for fatalities.

PT/Major – We would expect MC to have an impact on these claims. If the average indemnity impact for all claims is 20% we would expect the impact for PT/Major indemnity to be less. This is because MC cannot impact the indemnity on some claims (where the claimant will be unable to return to work (e.g., quadriplegic)). Additionally, as we discussed, MC (especially if case management is used) will likely reduce the percentage of PT/Major claims, thereby increasing the average severity on the remaining claims. For illustrative purposes, we have assumed that the MC impact for PT/Major indemnity to be 5%.

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[10] We will ignore medical-only claims as we assume that all medical-only claims will be below the deductible and fully retained by the insured. Also we have not assumed that MC will affect the distribution of medical-only claims.

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We have also assumed a lower than average impact on the medical claims because some integrated MC programs have probably been in place for these claims. For PT claims, many carriers have already negotiated lifetime care plans for severely injured workers. Therefore the savings due to introducing a more comprehensive program may not be as great as the all claim average. Additionally, the smaller claims are shifting to Minor/TT, which is increasing the average severities on the remaining claims. For this example, we have assumed the medical savings for these claims will be 5.0%.

- **Minor/TT** – MC will most likely impact the severities for these smaller claims, where integrated MC programs may not have been in place for an extended period of time. This group of claims includes some individuals who could have returned to work but were lingerers. Historically, for this category, case management and utilization reviews were not fully employed. Therefore for this group, we have assumed a savings of 8.0% for the indemnity component and a savings of 20.0% for the medical component.

Using the above mentioned savings with the statewide average severities listed in Table 8 results in the following severities subsequent to the introduction of MC.

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Table 9			
Type of Claim	Total	Medical Component	Indemnity Component
Fatal			
Before MC	95,372	19,074	76,298
After MC	95,372	19,074	76,298
PT/Major			
Before MC	102,784	61,670	41,114
After MC [1]	97,645	58,587	39,058
Minor/TT			
Before MC	5,084	2,542	2,542
After MC [2]	4,373	2,034	2,339

1) Assumes 5.0% medical savings and 5.0% indemnity savings
2) Assumes 20.0% medical savings and 8.0% indemnity savings

Additionally, due to a strong case management program, we can assume that the percentage of claims which are PT/major decrease from 3.55% to 2.84% (a 20% effect) and these claims move from PT/major to minor/TT (i.e., moves from 32.75% to 33.46%).

Therefore the effect of MC is displayed below[1]:

Table 10				
Types of Claims	Injury Weight[12]		Severity	
	Before MC	After MC	Before MC	After MC
Medical-only	6.9%	8.5%	625	625
PT/Major	63.1	59.0	102,784	97,645
Minor/TT	28.8	31.1	5,084	4,373
Fatalities	1.2	1.4	95,372	95,372
Total			5,778	4,701

[1] Note that we need to reweight the excess ratios by type of claim due to a shift in frequencies and severities.
[12] The number of claims for each injury type are needed to perform the calculation.

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Thus, MC reduces the average severity from 5,778 to 4,701 or 18.6%.

We can also use Mr. Gilliam's framework to determine the effect of MC on the excess loss distributions.

Exhibit 1 displays the excess ratio (portion of total losses expected to exceed the retention) at $100,000 of 18.4% prior to MC. With expected total losses of $50.0 million, the expected excess loss pure premium would total approximately $9.2 million.

However, taking into account the MC adjustments mentioned above results in an excess ratio of 16.6% (the calculation is described below) or a loss cost provision of approximately $6.62 million, for a difference of about 28.0% or $2.58 million.

Exhibit 1 from Mr. Gillam's paper can be adjusted for MC based on the above mentioned parameters. The calculations are similar for each loss type; therefore, we will only discuss the calculation for PT/major.

Exhibit 2 displays the revised calculation. Column (1) displays the loss limit. Column (6) displays the entry ratio for PT/Major. The entry ratio is equal to:

• The loss limit; divided by

- 1.1; divided by

- The average severity.

Dividing the loss limit by 1.1 is intended to adjust the excess ratios from a per-claim to a per-occurrence basis and is discussed in Mr. Gillam's paper on page 6. Next, the quotient is divided by the average severity to convert the claim size to an entry ratio. With MC, the PT/Major severity decreases from $102,784 to $97,645. Thus, the entry ratio at a loss limit of $100,000 increases from 0.88 to 0.93. This revised entry ratio changes the excess ratio (Column (8)) from 0.284 to 0.271.

Column (7) displays the injury weight on the losses for PT/Major relative to total losses. The injury weights are used to weight the excess ratios by type of claim to derive an all claim excess ratio.

We assumed that MC would reduce the PT/Major injury weight from 63.1% to 59.0%. Column (9) displays the partial excess ratio for PT/Major (which is the revised injury weight multiplied by the revised excess ratio). The partial excess ratios are then summed by loss limit to determine the all claims excess ratios (as shown in Column (14)).

Before MC the all claims excess ratio at 100,000 was 18.4%. After the above mentioned MC adjustments the revised all claims excess ratio is 16.6%. Additionally MC reduces total losses from $50 million to $40 million (20% reduction).

The reduction in excess ratios is largely due to:

- A shift in claims from PT/Major to Minor/TT (the PT/Major excess ratios are higher than the Minor/TT excess ratios); and

- A lower severity for most claims which results in larger entry ratios and lower excess ratios.

Somewhat offsetting these two factors is the significant decrease in minor/TT claim costs which results in giving more weight to the fatal excess ratios.

SUMMARY

Insurers have recently instituted more aggressive MC programs for workers' compensation claims. These include more comprehensive fee discounts, utilization review, case management and capitated arrangements. It is important to appropriately measure MC savings so MC can be reflected in insurers' pricing. This paper has outlined some pitfalls in measuring MC savings. MC programs will also effect both the:

- Average cost per claim; and

- Distribution of these costs.

The effects of the MC programs will vary by type of program and by type and size of claim. MC programs will separately affect indemnity costs and medical costs and have different impacts on primary layers of losses and excess layers. Insurers and reinsurers who price primary and excess layers of workers' compensation need to properly factor in the impact of MC.

EXHIBIT 1

National Council on Compensation Insurance
State M
Effective 01/01/89
Limited Fatal Benefits - Nonescalating PT/Major Benefits
Excess Loss Factors Calculation
Hazard Group II

	Fatal				PT/Major				Minor/TT				
(1) Loss Limit $	(2) Ratio to Avg / 1.1 (Entry Ratio)	(3) Injury Wgt	(4) Excess Ratio	(5) Excess Ratio x Inj. Wgt	(6) Ratio to Avg / 1.1 (Entry Ratio)	(7) Injury Wgt	(8) Excess Ratio	(9) Excess Ratio x Inj. Wgt	(10) Ratio to Avg / 1.1 (Entry Ratio)	(11) Injury Wgt	(12) Excess Ratio	(13) Excess Ratio x Inj. Wgt	(14) Average Excess Ratio
10,000	0.10	0.011	0.908	0.010	0.09	0.631	0.910	0.575	1.79	0.288	0.361	0.104	0.689
15,000	0.14		0.874	0.010	0.13		0.870	0.549	2.68		0.223	0.064	0.624
20,000	0.19		0.834	0.010	0.18		0.820	0.518	3.58		0.138	0.040	0.567
25,000	0.24		0.796	0.009	0.22		0.780	0.493	4.47		0.085	0.024	0.526
30,000	0.29		0.760	0.009	0.27		0.730	0.461	5.36		0.053	0.015	0.485
35,000	0.33		0.733	0.008	0.31		0.690	0.436	6.26		0.034	0.010	0.454
40,000	0.38		0.700	0.008	0.35		0.650	0.410	7.15		0.022	0.006	0.425
50,000	0.48		0.640	0.007	0.44		0.562	0.355	8.94		0.010	0.003	0.365
75,000	0.71		0.521	0.006	0.66		0.387	0.244	13.41		0.002	0.001	0.251
100,000	0.95		0.422	0.005	0.88		0.284	0.179	17.88		0.000	0.000	0.184
125,000	1.19		0.342	0.004	1.11		0.220	0.139	22.35		0.000	0.000	0.143
150,000	1.43		0.278	0.003	1.33		0.181	0.114	26.82		0.000	0.000	0.117
175,000	1.67		0.226	0.003	1.55		0.153	0.097	31.29		0.000	0.000	0.099
200,000	1.91		0.184	0.002	1.77		0.132	0.083	35.76		0.000	0.000	0.085
225,000	2.14		0.151	0.002	1.99		0.116	0.073	40.23		0.000	0.000	0.075
250,000	2.38		0.123	0.001	2.21		0.103	0.065	44.70		0.000	0.000	0.066
275,000	2.62		0.101	0.001	2.43		0.093	0.059	49.17		0.000	0.000	0.060
300,000	2.86		0.082	0.001	2.65		0.085	0.054	53.64		0.000	0.000	0.055
325,000	3.10		0.067	0.001	2.87		0.077	0.049	58.11		0.000	0.000	0.049
350,000	3.34		0.055	0.001	3.10		0.071	0.045	62.58		0.000	0.000	0.045
375,000	3.57		0.045	0.001	3.32		0.066	0.042	67.06		0.000	0.000	0.042
400,000	3.81		0.037	0.000	3.54		0.062	0.039	71.53		0.000	0.000	0.040
425,000	4.05		0.031	0.000	3.76		0.058	0.037	76.00		0.000	0.000	0.037
450,000	4.29		0.025	0.000	3.98		0.054	0.034	80.47		0.000	0.000	0.034
475,000	4.53		0.021	0.000	4.20		0.051	0.032	84.94		0.000	0.000	0.032
500,000	4.77		0.017	0.000	4.42		0.048	0.030	89.41		0.000	0.000	0.031
600,000	5.72		0.008	0.000	5.31		0.039	0.025	107.29		0.000	0.000	0.025
700,000	6.67		0.004	0.000	6.19		0.033	0.021	125.17		0.000	0.000	0.021
800,000	7.63		0.002	0.000	7.08		0.029	0.018	143.05		0.000	0.000	0.018
900,000	8.58		0.001	0.000	7.96		0.025	0.016	160.93		0.000	0.000	0.016
1,000,000	9.53		0.000	0.000	8.84		0.023	0.015	178.81		0.000	0.000	0.015
2,000,000	19.06		0.000	0.000	17.69		0.011	0.007	357.63		0.000	0.000	0.007
3,000,000	28.60		0.000	0.000	26.53		0.007	0.004	536.44		0.000	0.000	0.004
4,000,000	38.13		0.000	0.000	35.38		0.005	0.003	715.26		0.000	0.000	0.003
5,000,000	47.66		0.000	0.000	44.22		0.004	0.003	894.07		0.000	0.000	0.003
6,000,000	57.19		0.000	0.000	53.07		0.003	0.002	1,072.88		0.000	0.000	0.002
7,000,000	66.72		0.000	0.000	61.91		0.003	0.002	1,251.70		0.000	0.000	0.002
8,000,000	76.26		0.000	0.000	70.76		0.002	0.001	1,430.51		0.000	0.000	0.001
9,000,000	85.79		0.000	0.000	79.60		0.002	0.001	1,609.33		0.000	0.000	0.001
10,000,000	95.32		0.000	0.000	88.45		0.002	0.001	1,788.14		0.000	0.000	0.001

Fatal Average Cost per Case 95,372
PT/Major Average Cost per Case 102,784
Minor/TT Average Cost per Case 5,084

Note - Any differences from Mr. Gillam's paper are due to rounding

EXHIBIT 2 - Effect of Managed Care Savings

National Council on Compensation Insurance
State M
Effective 01/01/89
Limited Fatal Benefits - Nonescalating PT/Major Benefits
Excess Loss Factors Calculation
Hazard Group II

	Fatal				PT/Major				Minor/TT				
(1)	(2) Ratio to Avg / 1.1 (Entry Ratio)	(3) Injury Wgt	(4) Excess Ratio	(5) Excess Ratio x Inj. Wgt	(6) Ratio to Avg / 1.1 (Entry Ratio)	(7) Injury Wgt	(8) Excess Ratio	(9) Excess Ratio x Inj. Wgt	(10) Ratio to Avg / 1.1 (Entry Ratio)	11) Injury Wgt	(12) Excess Ratio	(13) Excess Ratio x Inj. Wgt	(14) Average Excess Ratio
Loss Limit													
$ 10,000	0.10	0.014	0.908	0.013	0.09	0.590	0.906	0.534	2.08	0.311	0.316	0.098	0.646
15,000	0.14		0.874	0.012	0.14		0.862	0.509	3.12		0.182	0.057	0.578
20,000	0.19		0.834	0.012	0.19		0.812	0.479	4.16		0.104	0.032	0.523
25,000	0.24		0.796	0.011	0.23		0.767	0.452	5.20		0.059	0.018	0.482
30,000	0.29		0.760	0.011	0.28		0.717	0.423	6.24		0.034	0.011	0.445
35,000	0.33		0.733	0.010	0.33		0.675	0.398	7.28		0.020	0.006	0.415
40,000	0.38		0.700	0.010	0.37		0.631	0.373	8.32		0.014	0.004	0.387
50,000	0.48		0.640	0.009	0.47		0.544	0.321	10.39		0.007	0.002	0.332
75,000	0.71		0.521	0.007	0.70		0.371	0.219	15.59		0.001	0.000	0.226
100,000	**0.95**		**0.422**	**0.006**	**0.93**		**0.271**	**0.160**	**20.79**		**0.000**	**0.000**	**0.166**
125,000	1.19		0.342	0.005	1.16		0.210	0.124	25.99		0.000	0.000	0.129
150,000	1.43		0.278	0.004	1.40		0.172	0.102	31.18		0.000	0.000	0.106
175,000	1.67		0.226	0.003	1.63		0.145	0.086	36.38		0.000	0.000	0.089
200,000	1.91		0.184	0.003	1.86		0.125	0.074	41.58		0.000	0.000	0.077
225,000	2.14		0.151	0.002	2.09		0.110	0.065	46.77		0.000	0.000	0.067
250,000	2.38		0.123	0.002	2.33		0.098	0.058	51.97		0.000	0.000	0.059
275,000	2.62		0.101	0.001	2.56		0.088	0.052	57.17		0.000	0.000	0.054
300,000	2.86		0.082	0.001	2.79		0.080	0.047	62.37		0.000	0.000	0.048
325,000	3.10		0.067	0.001	3.03		0.073	0.043	67.56		0.000	0.000	0.044
350,000	3.34		0.055	0.001	3.26		0.067	0.040	72.76		0.000	0.000	0.040
375,000	3.57		0.045	0.001	3.49		0.063	0.037	77.96		0.000	0.000	0.038
400,000	3.81		0.037	0.001	3.72		0.059	0.035	83.15		0.000	0.000	0.035
425,000	4.05		0.031	0.000	3.96		0.054	0.032	88.35		0.000	0.000	0.033
450,000	4.29		0.025	0.000	4.19		0.051	0.030	93.55		0.000	0.000	0.031
475,000	4.53		0.021	0.000	4.42		0.048	0.028	98.75		0.000	0.000	0.029
500,000	4.77		0.017	0.000	4.68		0.046	0.027	103.94		0.000	0.000	0.027
600,000	5.72		0.008	0.000	5.59		0.037	0.022	124.73		0.000	0.000	0.022
700,000	6.67		0.004	0.000	6.52		0.032	0.019	145.52		0.000	0.000	0.019
800,000	7.63		0.002	0.000	7.45		0.027	0.016	166.31		0.000	0.000	0.016
900,000	8.58		0.001	0.000	8.38		0.024	0.014	187.10		0.000	0.000	0.014
1,000,000	9.53		0.000	0.000	9.31		0.022	0.013	207.89		0.000	0.000	0.013
2,000,000	19.06		0.000	0.000	18.62		0.011	0.006	415.77		0.000	0.000	0.006
3,000,000	28.60		0.000	0.000	27.93		0.007	0.004	623.66		0.000	0.000	0.004
4,000,000	38.13		0.000	0.000	37.24		0.005	0.003	831.55		0.000	0.000	0.003
5,000,000	47.66		0.000	0.000	46.55		0.004	0.002	1,039.44		0.000	0.000	0.002
6,000,000	57.19		0.000	0.000	55.86		0.003	0.002	1,247.32		0.000	0.000	0.002
7,000,000	66.72		0.000	0.000	65.17		0.003	0.002	1,455.21		0.000	0.000	0.002
8,000,000	76.26		0.000	0.000	74.48		0.002	0.001	1,663.10		0.000	0.000	0.001
9,000,000	85.79		0.000	0.000	83.79		0.002	0.001	1,870.99		0.000	0.000	0.001
10,000,000	95.32		0.000	0.000	93.10		0.002	0.001	2,078.87		0.000	0.000	0.001

Fatal Average Cost per Case	95,372
PT/Major Average Cost per Case	97,645
Minor/TT Average Cost per Case	4,373