



Institute of Actuaries of Australia

# Measuring & Monitoring the Impact of Environmental Changes on Financial Outcomes for Personal Injury Claims

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This paper provides an overview of some techniques Trowbridge Deloitte has developed and used for measuring and monitoring the impact of environmental issues on financial outcomes for personal injury claims. The paper draws on case studies to illustrate the techniques developed for the Insurance Council of Australia (ICA) and insurers in response to changes to Compulsory Third Party (CTP) schemes in NSW and Queensland in recent years.

Together, the techniques developed enable a deep understanding of the impact of change through an integrated approach to portfolio analysis. This analysis extends from a detailed look at claims outcomes at a level below the normal systems data capture to the ‘big picture’ overall portfolio view. We believe that the techniques presented in this paper could be adapted for other CTP jurisdictions, workers compensation schemes or self insurance arrangements, public liability insurance and other forms of personal injury coverage.

## Setting the Scene

Major changes are inevitable in personal injury compensation systems. When they occur, they present major challenges for regulators, insurers and managers of compensation schemes, initially in assessing the likely impact of changes on the claims experience and then how to respond operationally.

Environmental changes may come about as a result of:

- Legislative changes which may impact
  - *Procedures for claims processing*, eg changes in the timelines for reporting claims, dealing with liability or changes to limit the involvement of lawyers
  - *Level or access to benefits*, eg changes in thresholds to access general damages or other benefit types or limits on care costs
  - *Fundamental scheme design*, eg removal of common law
- Behavioural Changes
  - by claimants, in response to legislative changes or economic circumstances
  - by plaintiff lawyers, in response to legislative changes which restrict costs or limit claimants’ access to certain compensation
  - by insurers, in response to the behaviour of claimants and their legal representatives, or through revisions to their claims strategies
  - by all stakeholders as community values alter
- Changes in claims management, eg changes in management staff or procedures
- Changes in injury management, eg changes in the manner in which claims are streamed according to risk/severity and managed accordingly, having a focus on rehabilitation in accordance with regulatory guidelines

- The weather, eg protracted periods of dry weather can be a significant impact on the level of road casualties and therefore claims for personal injury resulting from a motor vehicle accident.

Understanding the impact of environmental changes presents challenges for:

- Pricing
- Underwriting
- Claims & injury management
- Staffing
- Reserving for outstanding claims
- Expenses
- Capital allocation.

## **The Case Studies**

In response to the legislative changes to the CTP schemes in NSW and Queensland, insurers sought to be able to understand the impact on claims costs, the ongoing effectiveness of the changes and to be able to identify any areas of deterioration in the emerging experience post the changes. This paper draws on techniques we have developed to assist NSW and Queensland CTP insurers.

A brief description of the legislative changes follows.

### **NSW CTP**

Legislative changes made to the NSW CTP scheme in 1999 ('the 1999 Act') represented a major overhaul of the scheme design. The changes impact the manner in which claims are reported and processed and the level of both claimant compensation and legal costs. The objectives of the changes were to limit general damages to the 'worst' 10% of claimants, to focus on injury stabilisation as a trigger to commence resolution proceedings, limit the involvement of lawyers and contain the escalation of claims cost through superimposed inflation.

### **Queensland CTP**

In 2000, legislation impacting the Queensland CTP scheme ('the 2000 Amendments') included changes to claims processes, a requirement for compulsory conference and restrictions on legal costs. The objective of these changes was to speed up claim processing and reduce legal costs.

This was followed by major changes under the Civil Liability Act 2003 ('the 2003 Act') largely directed at reducing compensation for general damages for minor injury claims (mainly whiplash).

## Techniques for Measuring and Monitoring

This paper largely looks at the techniques developed for CTP insurers in Queensland and NSW to measure and monitor the impact of legislative change on settlement outcomes. However, the techniques developed would also be appropriate for examining the impact of other environmental changes and could be adapted for use in other CTP jurisdictions, workers compensation schemes or self insurance arrangements and public liability insurance.

The techniques developed to assist insurers include:

- Aggregate studies – quantitative analysis covering the whole industry, scheme or portfolio, with opportunities for individual insurers to benchmark their own performance against the industry
- Claim file reviews - including a detailed file review for a sample of claims to identify forensic features below the level of systems data capture
- Micro studies – study samples taken from a reasonably homogeneous group of minor injury claims.

### Aggregate Studies

Aggregate studies provide valuable information regarding emerging claims experience at the whole portfolio level. They can:

- examine emerging performance against pre change benchmarks
- measure changes in claims cost and monitor any changes in direction at the whole portfolio level
- highlight which types of claims and which payment types are contributing to changes in claims costs
- identify areas for further investigation
- provide input for pricing and outstanding claims provisions.

In multi-insurer systems aggregate studies also provide the opportunity for individual insurers to benchmark themselves against industry outcomes.

Aggregate analysis can be complicated by changes in the speed or order of claim settlement brought about by legislative change, changes in claims management practices or claim frequency.

### Claim File Reviews

The claim file studies take samples of claims with similar injury characteristics settled say, two years apart, and examine all aspects of the settlement process of those claims. They focus on forensic assessment of information at a level well below normal systems data capture. Such studies can be performed to assess changes (generally deterioration) in claims costs over time and changes in claims management and behavioural changes. For example, matters impacting

the settlement such as the attitude of the plaintiff lawyer, the level of initial offers, the responses of the claims managers and the presence of psychological factors can be compared for each settlement period.

These studies typically provide insights into the reason for changes in claims management outcomes which, having evolved gradually over time, have often gone unnoticed. The changes cannot be identified at the individual claim level, but only with the passage of time and using larger volumes of claims.

Claim file reviews can also be used to assess the likely impact of new legislation. In Queensland CTP where the latest legislative changes are expected to have a major impact on whiplash claims, we have been used claim file studies of such claims from the pre legislative environment to examine and assess the likely impact of the legislation on the cost of these claims.

## **Micro Studies**

Micro studies monitor the experience of a reasonably homogeneous group of claims and are aimed to act as a lead indicator of changes in scheme performance.

In NSW and Queensland CTP, success or failure of the 1999 Act and the 2003 Act in meeting their objectives with regard to cost containment, will be largely due to the containment of costs for minor injury claims and, in particular, whiplash claims. Whiplash claims therefore represent an ideal 'litmus test' for the effectiveness of the legislative changes. In both states, micro studies are being performed on behalf of the Insurance Council of Australia (ICA) to measure the impact of the legislative changes on claims costs, monitor the ongoing effectiveness of the legislation and identify any areas of deterioration in settlement outcomes for whiplash claims.

The whiplash studies involve:

- establishing initial benchmarks for settlement outcomes in the pre legislation environment
- measuring the impact of the legislation by comparing benchmarks for settlement outcomes in the pre and post legislation environments
- updating the post legislation settlement benchmarks to monitor and test the ongoing effectiveness of the legislative changes and identify any areas of deterioration for whiplash claims.

The measurement and monitoring is performed for overall settlement costs and for various components of cost (general damages, past and future economic loss, medical costs, plaintiff and defendant legal costs and investigation costs). The components of cost are examined according to the propensity for a claimant to receive a particular component and the average size of the benefit received/payment made.

The benchmarking process uses Generalised Linear Modelling (GLM) to identify the significant factors driving settlement outcomes and model the outcomes for each component of cost. Typically injury severity, whether the claimant is legally represented or not and

settlement delay are major drivers of all costs. The claimant's age, gender, employment status and occupation can impact some but not all cost components.

In a micro study, the claims sampled to establish the benchmarks are normalised by injury severity and other factors impacting settlement outcomes so that changes in the order of claim settlements or claim frequency that complicate analysis for aggregate studies are not an issue for micro studies. This 'normalisation' enables measurement of the impact of legislative change and comparison of outcomes over time on a like-with-like basis.

The 'litmus test' will differ for other forms of personal injury compensation. For example, for public liability insurance, 'slip and fall' claims would be a possible candidate. For workers compensation, extended duration soft tissue back injuries might be suitable.

## Results of Studies

Some of the findings of the studies we perform for NSW and Queensland CTP are presented below.

### Aggregate Study – NSW CTP

The aggregate study performed on behalf of the ICA includes an examination of emerging claim frequency and claim costs under the 1999 Act and compares this to the pre 1999 Act experience.

Examples of the monitoring performed are shown in Figures 1 to 6. These provide the following insights regarding the performance of the scheme:

- Claim frequency (Figure 1) is almost half the pre 1999 Act levels
- While a large majority of reports in the first year of the 1999 Act are settled (Figure 2), 2,500 claims remain open of which 700 are currently waiting on a CARS (the MAA's Claims Assessment and Resolution Service) assessment and 300 have indicated their intention to proceed to Court
- In line with the objectives of the 1999 Act, the level of legal representation has reduced (Figure 3)
- The incurred cost (payments plus insurer case estimates all unadjusted for inflation) per vehicle as at 30 June 2004 is similar across all 1999 Act accident periods and is 23% below pre 1999 Act levels (Figure 4), ie the drop in claim frequency is not mirrored by the drop in claims cost implying that it is the smaller claims that have left the system.
- In line with the objectives of the 1999 Act, the average cost of finalised claims under the 1999 Act has reduced due to a reduction in the proportion of claims gaining access to general damages and lower legal costs (Figure 5).

- Payments made on reported claims under the 1999 Act, expressed as a proportion of incurred costs, are below the levels in the pre 1999 Act environment at the same stage of development (Figure 6). Backlogs in the systems that deal with medical assessment and claims resolution are contributing to this result.

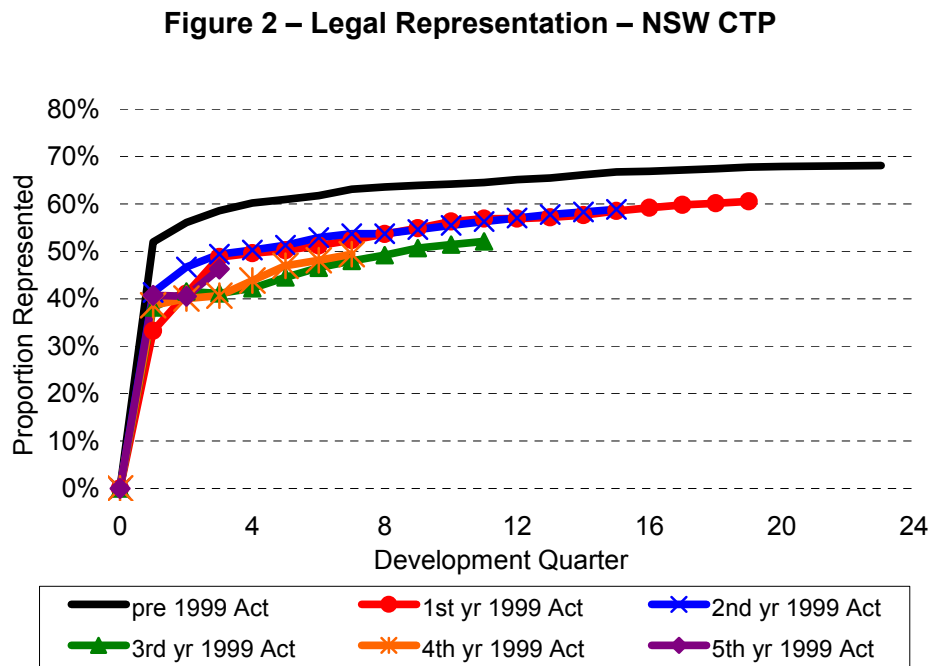
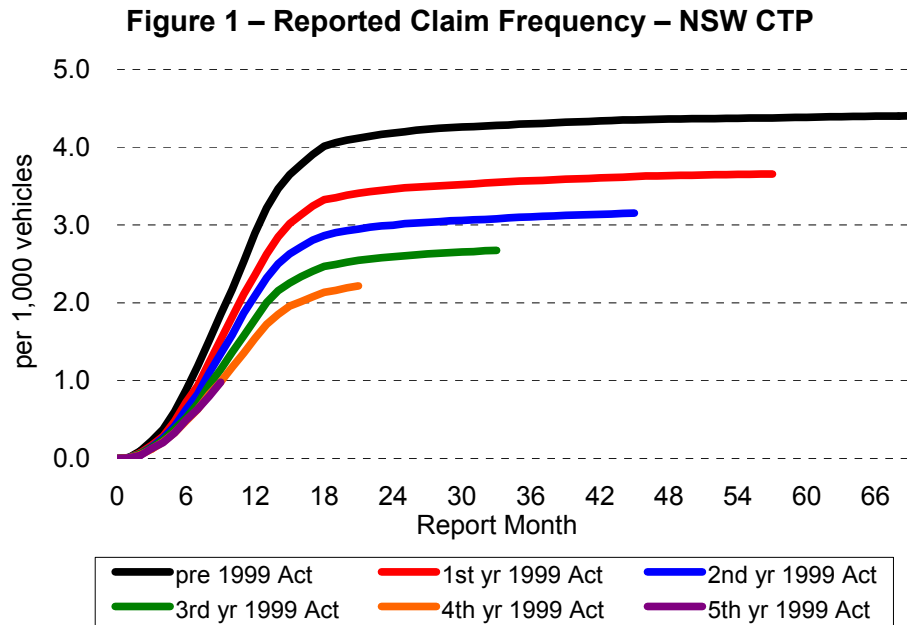




Figure 3 – Progression of Claims – NSW CTP First Year of 1999 Act

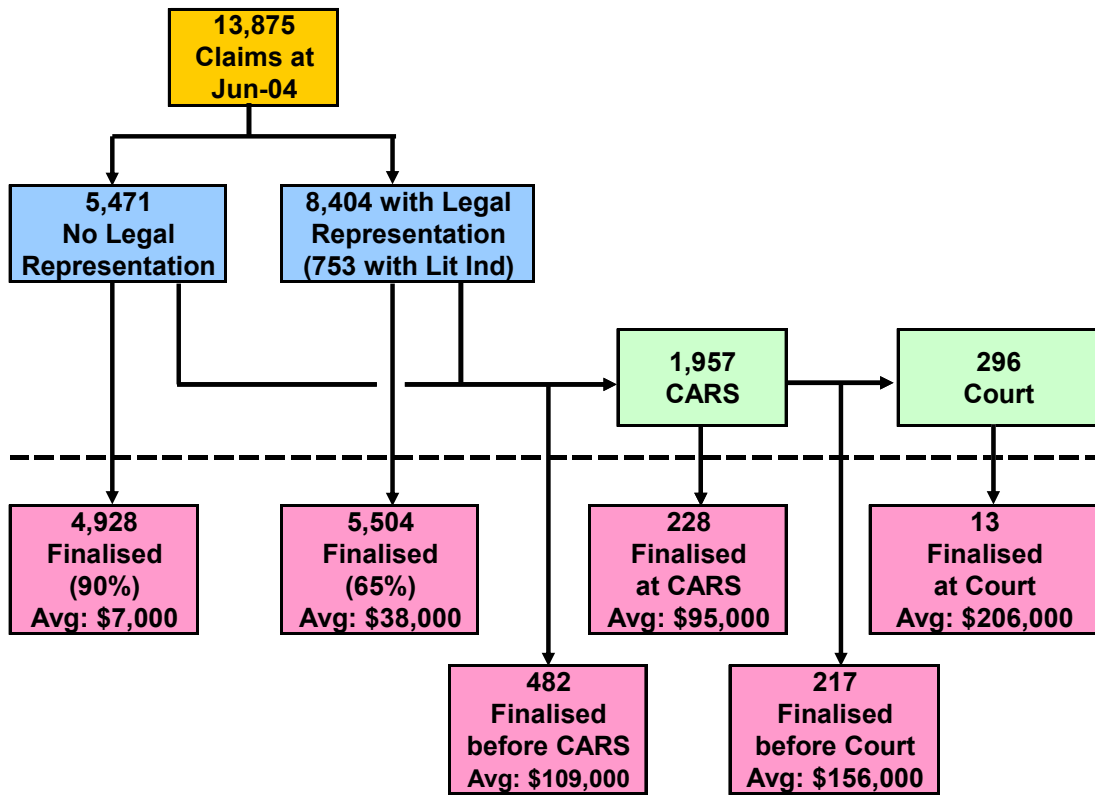
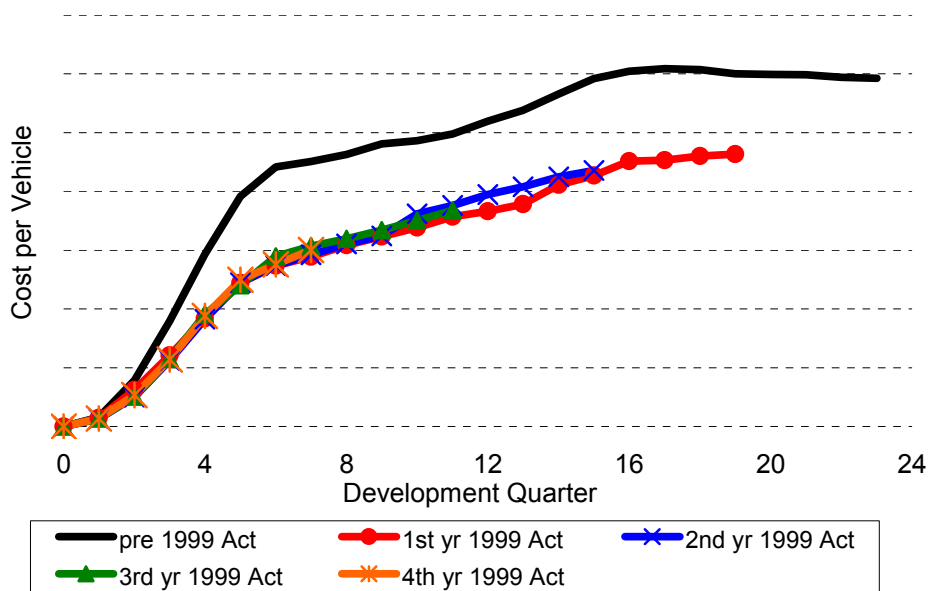
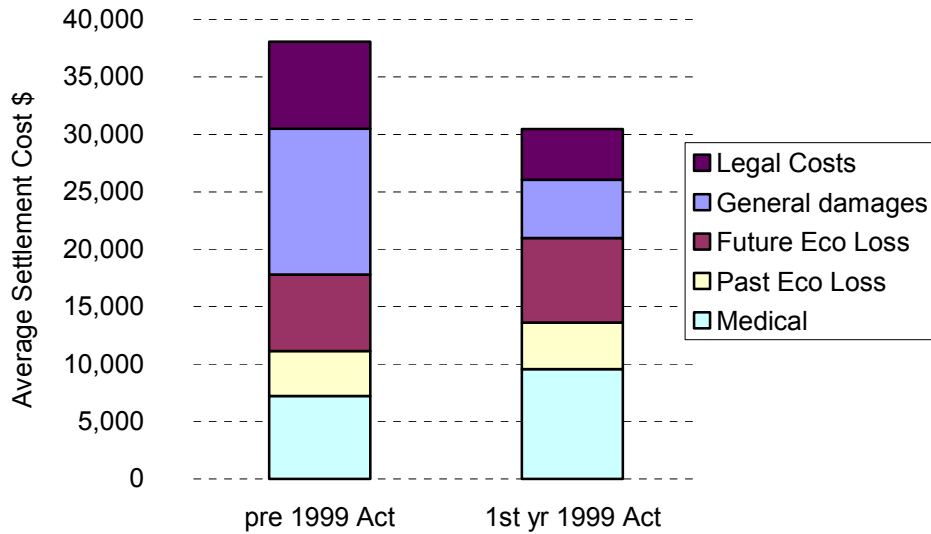


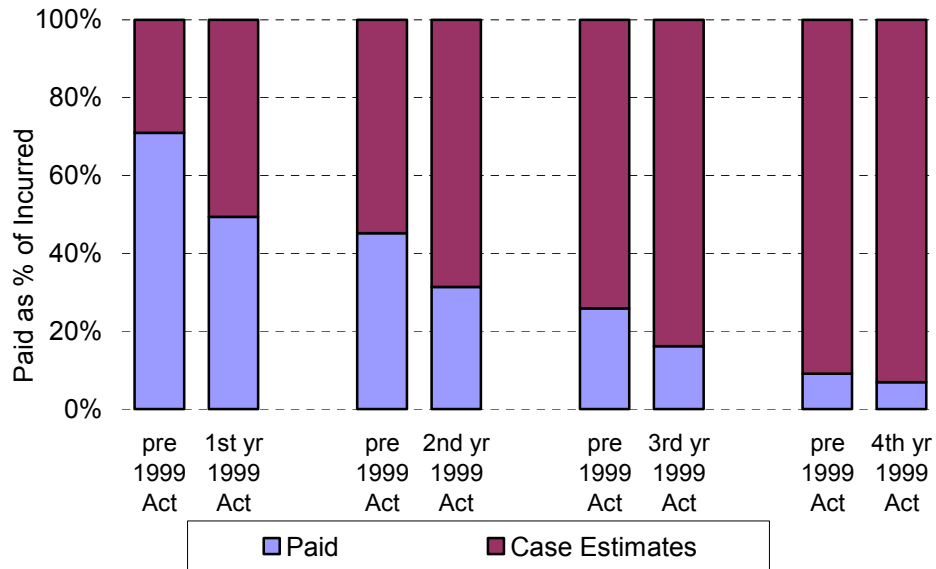
Figure 4 – Incurred Cost per Vehicle at 30 June 2004 (unadjusted for inflation)



**Figure 5 – Average Settlement Costs by Cost Component – NSW CTP as at 30 June 2004**



**Figure 6 – Paid as % of Incurred – NSW CTP**



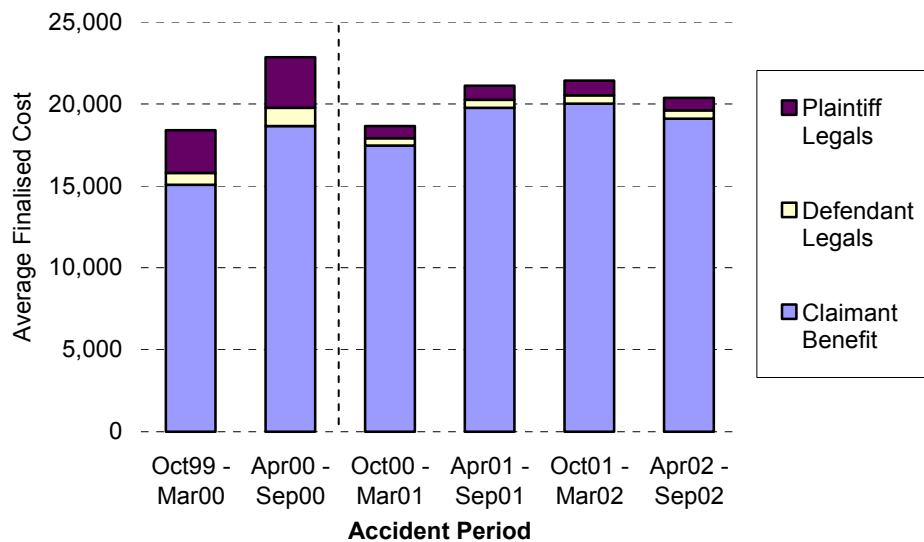
**Aggregate Study – Queensland CTP**

An aggregate study performed on behalf of the ICA examined the drivers of the increase in claims cost in the Queensland CTP scheme subsequent to the 2000 Amendments and prior to the 2003 Act. The study revealed that while the restrictions on legal costs introduced in the legislation initially led to a reduction in claims costs, the savings in legal costs were more than compensated for by increases in awards for general damages and future economic loss.

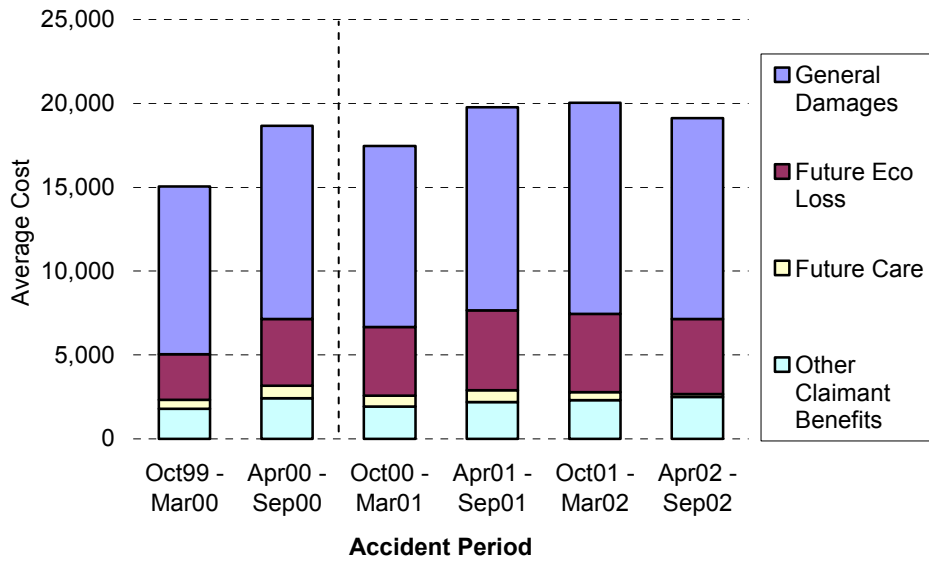
In Figures 7 to 10 below, the average cost of whiplash claims finalised in the pre 2003 Act environment and within 24 months of their accident date is examined. (The timing of the 2000 Amendments is indicated by the vertical dotted line in each graph.) Over the period examined claim frequency fell by around 20%. Isolating whiplash claims reduces the impact of the movement in claim frequency. The analysis is based on industry wide Queensland CTP data to 30 September 2004. The figures show:

- A substantial reduction in plaintiff legal costs resulting from the 2000 Amendments but steadily increasing claimant benefits over the accident periods examined (Figure 7)
- The increase in average claimant benefits was due to increases in average awards for general damages and future economic loss (Figure 8)
- The increase in average awards for general damages was due to an increase in the average benefit paid; the proportion of claims receiving general damages has fallen slightly (Figure 9)
- The increase in average awards for future economic loss was driven by increases in both the proportion of claims receiving future economic loss benefits and the average benefit paid (Figure 10).

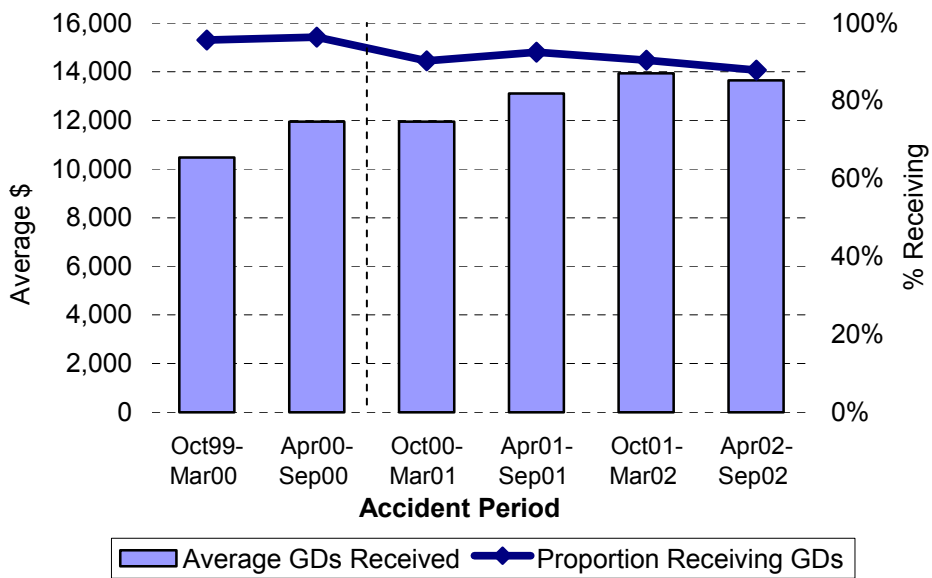
**Figure 7 – Average Cost of Finalised Claims**



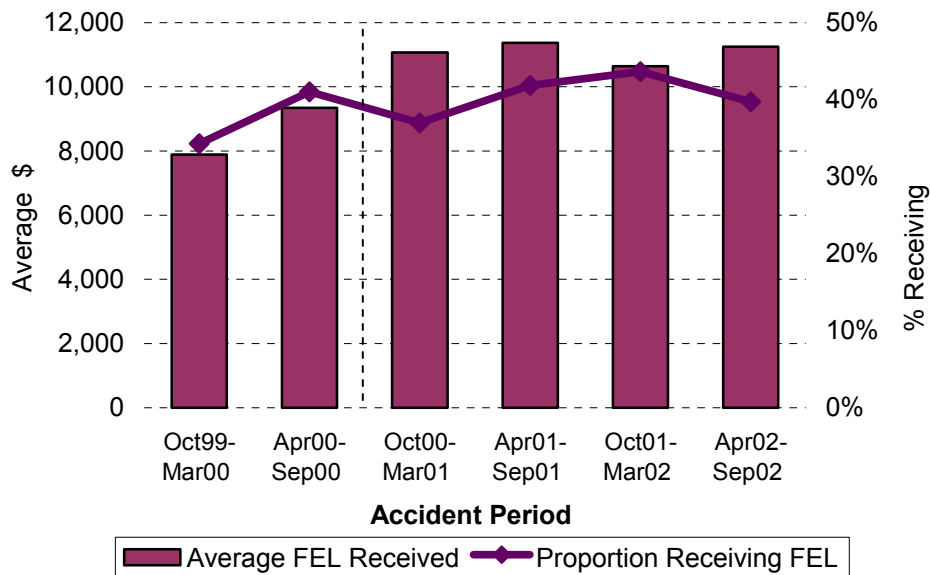
**Figure 8 – Average Claimant Benefits by Head of Damage**



**Figure 9 – General Damages (GDs)**



**Figure 10 – Future Economic Loss (FEL)**



**Claim File Review – Queensland CTP**

We have performed claim file studies for Queensland CTP claims to further understand the causes of the increases observed in the aggregate cost of claims. Examples of two examinations carried out as part of these studies are outlined below.

**Offers and counter offers**

Examination of Queensland CTP minor injury claims settled in 2000 and 2002 in the pre and post 2000 Amendments settlement environment revealed an increase in the size of initial demands by claimants or plaintiff solicitors and corresponding increases in insurer offers.

Such studies showed a doubling in the initial offers for minor injury claims from third parties and in response, a doubling of the initial insurer offer. The resulting settlements were found to be around 50% higher between the periods. This is superimposed inflation at work. Insurers are not necessarily aware of the significant inflationary effect identified in these studies because the changes tend to occur gradually and the influences are at a level below the data held on the system.

Figure 11 indicates the movements over the two year period.

**Figure 11 – Movement in Settlements**



### Other Influencing Characteristics

We have developed a particular methodology to measure the impact that additional “aggravating factors” have on settlement outcomes. Aggravating factors include:

- the alleged presence of other injuries
- plaintiff solicitor approach and influence
- adverse claimant characteristics (age, alcohol, drugs, smoke, obesity, pre-existing medical condition/injury)
- practitioner referrals (plaintiff referrals to specialists, physiotherapists etc)
- the level of alleged psychological vulnerability
- the age of the claim (length of time to finalisation).

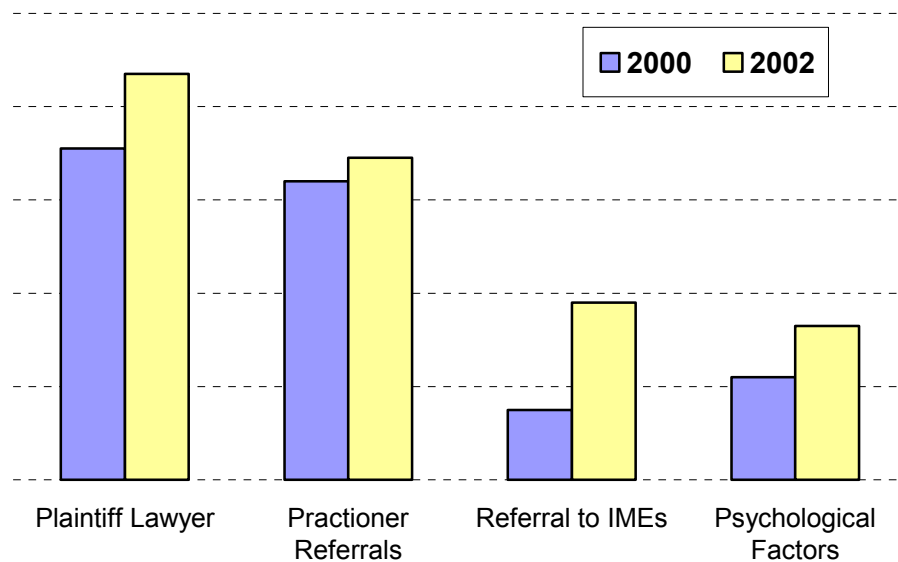
Independent medical referrals (by the insurer or scheme) can also be considered, but are not strictly an ‘aggravating factor’, rather they represent a mitigating influence.

The presence of aggravating factors has the ability to escalate a claim significantly, taking a claim from ‘*minor*’ to ‘*moderate*’. The impact of these aggravating factors can be added to the ‘normal’ assessment of injury severity to produce an Overall Severity Rating (OSR) for the claim.

It is usually easy to demonstrate that the escalation of OSR (due to aggravating factors) has a direct impact on settlement outcomes. Again, insurers can be unaware of these portfolio characteristics of their claims and the effect that they are having on results. While it should be recognised that there is an element of subjectivity in this process, the results produced provide a fair assessment of some of the drivers of the upward movement in settlement outcomes.

In Figure 12 the impact of aggravating factors identified in a claim file review of minor severity CTP claims between 2000 and 2002 is compared. The comparison shows the increasing influence of aggravating factors over the two year period.

**Figure 12 – Impact of Aggravating Factors**



### Micro Studies – NSW & Queensland CTP

Studies of whiplash claims in the NSW and Queensland CTP schemes are being performed on behalf of the ICA for the dual purpose of measuring reductions in claims cost due to legislative changes and monitoring the emerging experience under the new legislation.

We have performed such studies on behalf of the ICA for NSW CTP since 1997. The current study of 1999 Act claims measures the impact of the 1999 Act on claims costs and measures the ongoing effectiveness of the legislation.

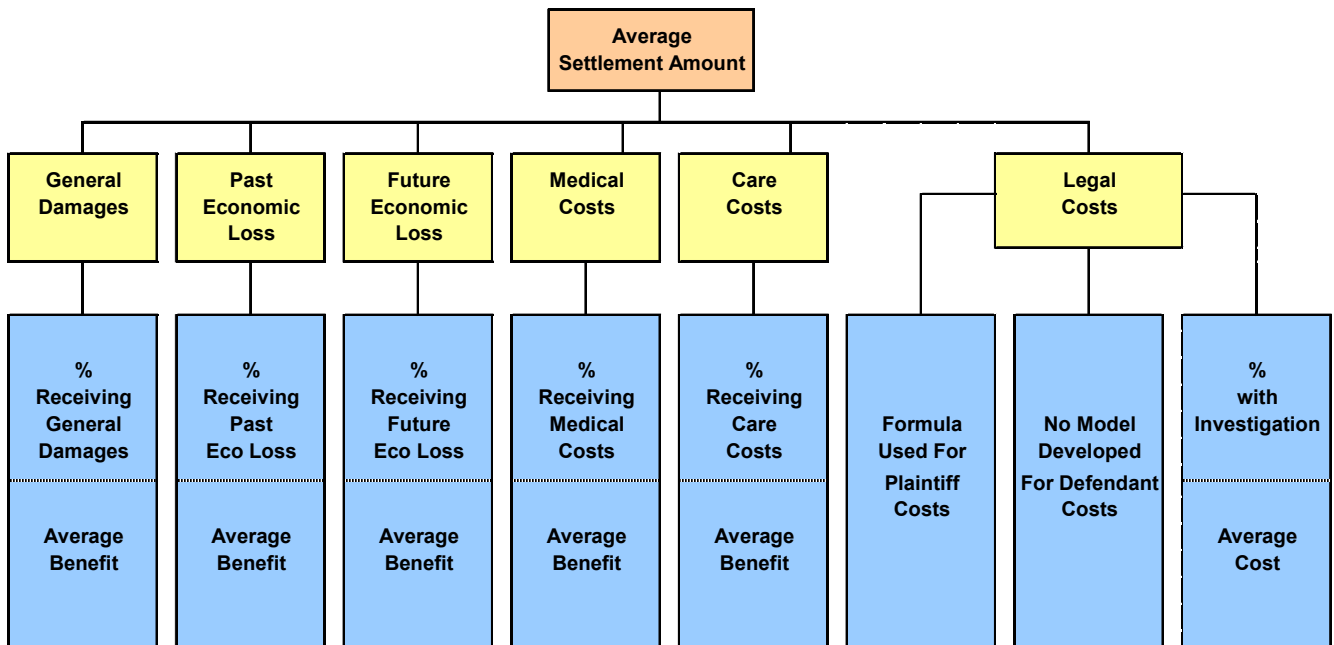
The Queensland CTP whiplash study is in its early stages with initial benchmarks having been established for pre 2003 Act claims against which the post 2003 Act experience will be monitored and the impact of the legislation measured.

This section of the paper presents some of the findings of the whiplash studies performed for NSW and Queensland CTP.

The modelling process to establish the benchmarks for both studies looks at each component of claim cost separately and develops separate models for the propensity to receive a particular component of cost and the average size of the benefit received/payment made. Figure 13 summarises the models developed for the Queensland whiplash study. Due to the nature of the legal cost restrictions in Queensland, a formula based model was used for plaintiff legal costs.

Defendant legal costs were minor or non-existent so that a statistical model was unable to be developed.

**Figure 13 – Models Developed to Benchmark Queensland CTP Claims**



For Queensland CTP, awards for general damages and future economic loss make up 80% of the cost of whiplash claims in the pre 2003 Act environment. The explanatory variables, identified in the whiplash study, as the significant drivers of outcomes for these heads of damage are shown in Table 1.

**Table 1 – Significant Factors Impacting Claim Cost Outcomes**

Head of Damage	Injury Severity	Legal Representation	Employment Status	Settlement Delay	Age	Gender
<b>General Damages</b>						
▶ proportion receiving		✓		✓		
▶ average payment	✓	✓				✓
<b>Future Economic Loss</b>						
▶ proportion receiving	✓	✓	✓		✓	
▶ average payment	✓					✓

As can be seen injury severity and whether or not the claim had a legal representative were found to be significant drivers of costs for both general damages and future economic loss.



## Impact of Legislative Change

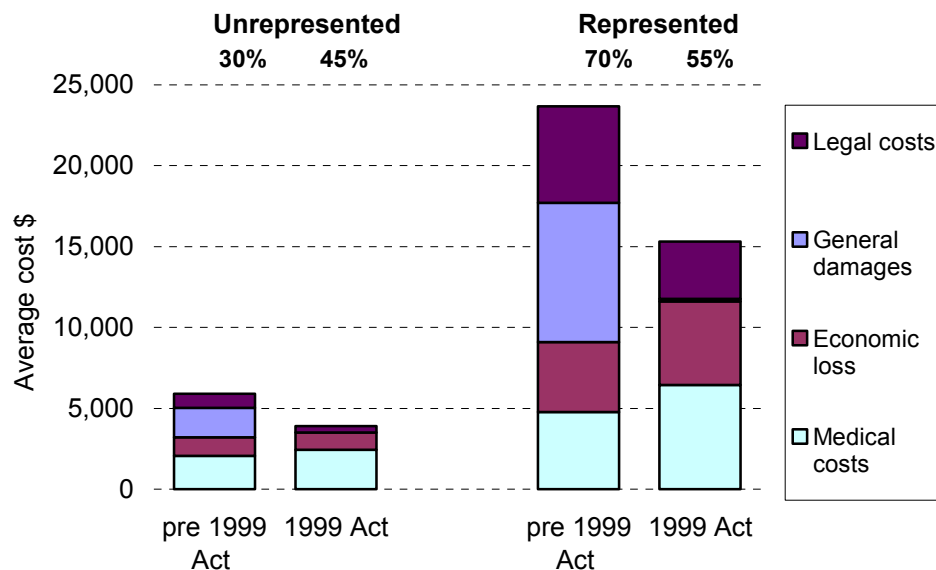
The NSW CTP whiplash study enables quantification of the impact of the 1999 Act on claims costs for whiplash claims.

By sampling whiplash claims settled in 2003/2004 under the 1999 Act and putting the profile of these claims into pre 1999 Act benchmarks (adjusted for wage inflation to 2003/2004), a comparison of the cost of whiplash claims in the pre and post 1999 Act environment can be made on a like-with-like basis. The results are summarised in Figure 14 and show:

- substantial reductions in the overall cost of claims due to the elimination of general damages and close to halving of legal costs
- an increase in average medical costs
- an increase in average awards for economic loss for represented claims.

These results are consistent with the findings of the aggregate study.

**Figure 14 – Impact of 1999 Act on Cost of Whiplash Claims – NSW CTP**



In the 1999 Act environment, legally represented claims represent around 55% of reported whiplash claims. This compares to around 70% of reported claims in the pre 1999 Act environment. Combined with the reduction in claim costs, the reduction in the proportion of represented claims translates to a bigger overall cost reduction.

### Legally Represented versus Unrepresented

One of the important findings of the whiplash studies conducted in NSW and Queensland is the quantification of the differences in the cost of claims with and without legal representation. Using the benchmarks to adjust for the different claim profiles of the two groups of claims, the

average cost of a represented claim can be compared on a like-with-like basis with an unrepresented claim. In Figure 15, like-with-like comparisons are made for:

- NSW CTP whiplash claims settled in the 1999 Act environment
- Queensland whiplash claims settled in the October 2000 Amendments environment and prior to the 2003 Act.

**Figure 15 – Represented vs Unrepresented Claim Costs**

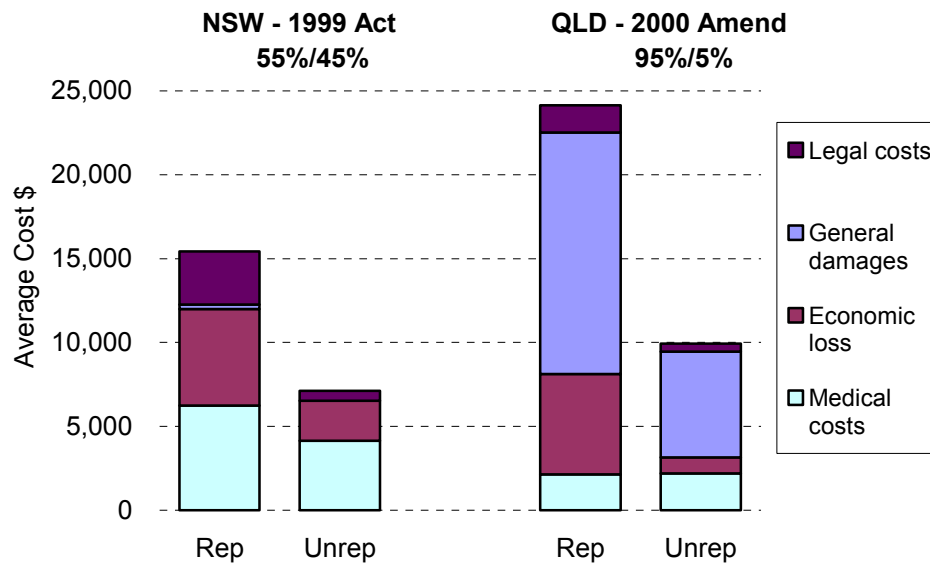


Figure 15 shows the cost of represented claims is substantially higher than comparable unrepresented claims:

- For NSW 1999 Act claims, represented claims cost \$8,000 more than unrepresented claims due to higher costs for economic loss (additional \$3,000), medical costs (additional \$2,000) and legal costs (additional \$3,000)
- For Queensland 2000 Amendments claims, represented claims cost \$14,000 more than unrepresented claims due to higher costs for general damages (additional \$8,000), economic loss (additional \$5,000) and legal costs (additional \$1,000).
- A further breakdown of the differences in general damages and economic loss for Queensland CTP is shown in Table 2. The table shows that the higher costs for general damages is due to the size of the average award paid; the proportion receiving general damages being similar for unrepresented and represented claims. The higher cost for economic loss is driven by a higher proportion of claims receiving future economic loss and the average amount paid.

**Table 2 – Breakdown of Economic Loss & General Damages – Queensland CTP**

	Represented	Comparable Unrepresented
<b>General damages</b>		
- proportion receiving	100%	96%
- average award	14,400	6,600
- overall cost	14,400	6,300
<b>Future Economic loss</b>		
- proportion receiving	51%	0%
- average award	9,800	n/a
- overall cost	5,000	-
<b>Past Economic loss</b>	1,000	1,000

## Conclusions

The work we undertake for insurers (individually and collectively) demonstrates to us the importance of having a handle on the drivers of changing claims outcomes at a portfolio level, given the capital at stake and the potential shareholder value involved.

The techniques discussed in this paper for measuring and monitoring the impact of changes can provide valuable information regarding emerging claims experience, early warning signals of any unfavourable experience and insights into the causes of any changes in direction. These techniques are suitable for all types of personal injuries regimes:

- CTP whether privately underwritten or regulator controlled
- Workers compensation schemes and self insured arrangements
- Public liability insurance
- Other forms of personal injury coverage.

The outcomes of the analyses performed also provide an evidence bank to support the need for review or legislative changes in scheme design or compensation levels or to support a view regarding the effectiveness of new legislation.

While the case studies presented in this paper largely examine the measurement and monitoring of legislative change, the techniques developed could also be used to examine the impact of changes in claims management, injury management and other behavioural changes.

## **Acknowledgements**

The author would like to express gratitude to the ICA and NSW and Queensland CTP insurers for their approval to publish the results presented in this paper.

## **Reliances and Limitations**

The views and opinions expressed in this paper are solely those of the author and may not reflect those of the parties that have contributed information for our studies.

The information used in this paper relies upon data extracted from studies performed by Trowbridge Deloitte on behalf of the ICA and NSW and Queensland insurers for the NSW and Queensland CTP schemes and therefore relies on the accuracy of the data underlying those studies. The material contained in the paper has been compiled for the purpose of demonstrating the monitoring techniques discussed and should not be used or relied upon in drawing conclusions about scheme performance or in any other context.

This paper does not purport to present all the techniques that can be applied to measuring and monitoring the impact of change on personal injury claims but will hopefully provide some food for thought for improving current practices.

## **About the Author**

Karen Whittred is a partner with Trowbridge Deloitte where she leads the CTP team. She has been providing advice to clients in the CTP industry since 1996 on matters ranging from actuarial pricing and reserving to more strategic advice around claims management and monitoring. In this role, she has provided advice to insurers, industry bodies, industry schemes and regulators.