

Review of Employer-managed Workplace Injury Claims

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Appendices

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Appendix 1: Detailed description of ACC schemes

The Work Account

The Work Account provides coverage for injuries to employees, the self-employed, and privately employed domestic workers. It is funded by a levy based on liable earnings – that is earnings up to a cap per employee – currently \$110,000.

Except for partnership programme employers, claims are managed directly by ACC, and cover:

- treatment and rehabilitation including
 - medical, physiotherapy, surgical and other rehabilitation costs
 - rehabilitation costs
 - other support to help employees return to work or independence as quickly as possible including: planning rehabilitation, home help, transport, attendant care, childcare, housing modifications, workplace assessments, workplace modifications, vocational aids, training for independence and education support.
- Loss of earnings compensation up to 80% of earnings subject to the dollar cap

The Work Account Levy

Regulatory requirements

The levy is set by order in council following consultation by ACC. It is subject to the statutory requirement that the levy is set so that costs of all claims are fully funded. In practice ACC sets a policy consistent with this requirement, and a final decision on the levy is made taking into account an actuarial assessment. As such the policy can vary from time to time.

Overview of calculation

An 'average' levy rate is determined in accordance with the funding policy. The rate is then adjusted for industry based levy risk groups to reflect their relative cost of injuries. The adjustment is calibrated so as not to change the total levy income.

Funding policy

The current policy is to set the levy on the basis of:

- A The fully funded cost of claims and expenses for injures that are expected to be incurred during the upcoming levy year

PLUS OR MINUS

B A 'funding adjustment' intended to achieve full funding (if there isn't already) over a period of at most 10 years

PLUS OR MINUS

C A smoothing adjustment to provide stability.

However, the levy cannot be set to be lower than 'A'.

Elements 'B' and 'C' cater for the situation where the out turn is different to 'A'.

New year levy rate calculation

The levy rates applicable for funding costs associated with the new year's claims (equivalent to 'A' above) is calculated according to the following formula:

$$\frac{\text{discounted claim costs} + \text{discounted expenses} + \text{risk margin}}{\text{exposures} \times (1 - \text{bad debt rate}) \times (1 - \text{average WSP discount})}$$

Where:

- **Discounted claim costs** are the actuarially determined expected costs of all claims relating to the claim year. Since an element of these will be incurred over several future years the cost has been discounted back to the claims year.
- **Discounted expenses** similarly cover ACC's expenses in claims handling, operation, injury prevention, and levy collection.
- **The risk margin** reflects ACC policy that there should be a 75% probability that the amount set is sufficient (ie it should be above a mid point estimate).
- **Exposures** is the total liable earnings of all employees and self employed covered by the scheme.
- **Bad debt rate** reflects that not all levies will be collected. The adjustment means these will be covered by other employers
- **Average WSP discount** is the weighted average discount given to WSP members. The adjustment compensates for this loss of levy income.

Funding adjustment

The funding adjustment (corresponding to 'B' above) is calculated by projecting cashflows for claims, expenses, levy income and investment returns and examining the ratio of projected assets to outstanding claims liability at the end of each future levy year, including a risk margin.

The funding adjustment is currently nil.

Risk Rates

The actuarial models are used to calculate a standard levy rate per \$100 of eligible earnings. A weighting is then applied to each of 535 industry classification groups.

The current weightings range from 0.04 (eg legal and accounting services) to 8.06 (eg thoroughbred jockeys and professional rugby players). They are set so as not to change the national total that would be collected in their absence.

The establishment of the groups requires a trade-off between being large enough to provide stable, actuarially credible data, and being small enough to avoid cross-subsidisation between industries with different risk profiles. To avoid fluctuation the weighting is based in turn on a weighted average of data for the last 7 years.

Role of ACC

For the Work Account, ACC is responsible under the Act for:

- Working with employers and self-employed people to develop and implement programmes to prevent injury in the workplace
- Ensuring you and your employees have access to health and disability support services for treatment and support when you/your employees are injured
- Ensuring you and your employees have access to social and vocational rehabilitation services for treatment and support when you/your employees are injured
- Providing financial assistance to help you/your employees to rehabilitate
- Providing ongoing support for you/your employees in the event there are longerterm/ more complex needs
- Maintaining stable levies by managing costs and maximising value for employers, self-employed people and ACC.

Role of Employers

Employers are responsible for providing ACC with the information needed to invoice levies, and for paying those levies.

In the event of an injury leading to a claim, employers are responsible for:

- recording and reporting the injury
- investigating the cause of the injury
- providing evidence of the employees wages
- meeting the first week of compensation if there is time off work

- planning a safe return to work, in liaison with the employees health provider
- monitoring and reviewing once the employee starts back at work to make sure they are not re-injured or the medical condition does not deteriorate.

Workplace Safety Management Practices (WSMP)

The Work Place Safety Management Practices programme provides levy discounts to employers who are able to demonstrate robust injury prevention practices.

Admission is on the basis of an independent audit of safety systems and procedures and is valid for 24 months. The audit of safety systems and procedures is compliance, not outcome based.

Three levels of discount are available based on the level of practices:

- Primary – programme entry level requirements – earns a 10% discount
- Secondary – consolidation of good practice – earns a 15% discount
- Tertiary – continuous improvement and a best practice framework – earns a 20% discount.

There is no formal actuarial process by which these discount rates are determined. They are clearly round sum amounts, but we understand from ACC that they accord approximately with the relative performance of participants.

Audit approach

ACC publishes audit standards which cover 10 'critical elements' each with a number of specific requirements. In many but not all cases, the requirements are graduated according to primary, secondary and tertiary levels. The audit standards are aligned with AS/NZS 4801:2001 the joint Australia/New Zealand Standard for Occupational Health and Safety Management Systems.

The critical elements are:

1. employer commitment to safety management systems
2. planning, review and evaluation
3. hazard identification, assessment and management
4. information, training and supervision
5. incident and injury reporting, recording and investigation
6. employee participation in health and safety management
7. emergency planning and readiness
8. protection of employees from on-site work undertaken by contractors and sub-contractors

9. workplace observation
10. focus group interviews with management and employees.

PDP Programmes

General description

As noted, under **Partnership Discount Plans** (PDP1 and PDP2) for each injury event, employers meet the cost of claims incurring in the injury year and the following year (PDP1) or following two years (PDP2). ACC meets any residual costs.

Employers initially manage the claim which is then passed to ACC at the end of the PDP period. Employers receive a discount on the levy broadly equivalent to the costs they are expected to meet – calculated on the experience with the standard scheme. This means that employers will gain if they achieve lower claims rates taking into account severity than the average for their industry grouping.

Eligibility and joining

PDP programmes are open to employers who can:

- Meet prescribed **audit standards** covering
 - safety management practices
 - injury management, including claims administration and rehabilitation
 - demonstration of safe systems in action.

Audit standards exist for both entry and annual renewal.

- Show sufficient financial resources to be able to meet reimbursement and entitlement costs without difficulty. Application requires a credit assessment from an independent rating agency.

Joining employers are required to notify all staff of the intention to join and consult with employee representatives.

Levies and insurance fees

Overview

The levy paid by PDP members comprises:

- **Partnership Programme Administration fee**
- **Unallocated Primary Health Cost charge**
- **PDP Discounted work levy fee**
- **Stop loss levy** (optional)

The last two are subject to (further) discount according to the safety management practices discount status of the employer. We describe each element in turn.

Partnership Programme Administration Fee

This comprises the direct costs of supporting the programme and indirect costs: levy setting, levy collection, injury prevention, health and safety and general overheads.

Allocation is determined using a combination of ACC's expense allocation and discussion with operational areas that provide services to Partnership Programme employers.

Unallocated Primary Health Cost charge

There are injury related primary health costs incurred by ACC for which employer information is not available or incorrect. In these cases, ACC is not able to determine whether they should be met from the Work Account or recharged to a partnership programme member.

The charge is expressed as a percentage of the work levy and calculated as:

total unallocated primary health costs

$$\frac{\text{total unallocated primary health costs}}{\text{total work levy for standard employers} + \text{work levy for accredited employers}}$$

total work levy for standard employers + work levy for accredited employers

PDP Discounted work levy

PDP members receive a discount reflecting the cost of claims (and the cost of managing those claims) that they will pay in the management period. The management period is the claims year plus the following one year (PDP1) or two years (PDP2).

The calculation is a four step process.

1. Average levy discounts

The proportion of direct claims costs an employer would expect to pay in the management period are calculated using historical and projected data. The calculation is done for each of the last 5 claims years. The proportion is relatively stable, and a discount for the coming year selected by inspection.

Claims handling expenses are not allocated directly to individual claims so the same approach cannot be adopted. The discount for claims handling is set at 65% for PDP1 and 75% for PDP2.

In principle corrections for the funding and smoothing adjustments are then applied. For the 2010/11 year these adjustments cancel each other out, so no corrections were made to the levy discount.

2. Relativities by levy risk group

The actual portion of claims paid in the management period varies considerably by levy risk group. For example, an industry with a relatively high proportion of small claims (usually quickly resolved) should expect to receive a larger discount.

The proportions are analysed by levy risk group using weighted averages of recent years. These are used to calculate relativities for each levy group.

These relativities are speed of payment relativities unlike those for standard employers which are cost of claim relativities.

3. Determination of levy risk group specific discount rates

The levy risk group specific discount rates are then determined by adding:

- a) direct claims costs adjusted for relativity
- b) claims handling expenses apportioned according to direct claims costs
- c) risk margin apportioned according to direct claims costs
- d) bulk billed claims costs and provision for doubtful debts (these are the same as for standard employers)

4. Levy rate smoothing

Any levy rate increase or decrease for any CU is capped at 25% of the change in the aggregate levy rate. Any excess (over or under) is then spread over uncapped CUs in the PDP employer pool.

The PDP discounted work levy is applied in addition to any WSMP discounts to which the employer is entitled.

Stop loss levy

Stop loss is optional for PDP employers and is available for chosen amounts between 160% and 250% of expected claims costs.

The levy is calculated based on empirical data on the distribution of claims size. Two risk margins are then added:

- *Expected loss band* This is varied according to the absolute dollar value of expected losses. Larger employers with greater expected numbers of claims are likely to be subject to lower volatility.
- *Stop loss limit* This is varied according to the stop loss limit. Because higher limits will be exceeded more rarely, they will be subject to higher volatility and given a higher risk premium.

Role of ACC

For PDP members, ACC is responsible for:

- providing advice on the scheme
- injury prevention advice
- advice on rehabilitation management
- interpretation of legislation
- coordination of audits
- disputes and complaints resolution and review
- assessment of lump sum compensation
- fraud management advice.

Role of Employers

Under the PDP, employers have agreed to 'stand in the shoes' of ACC in promoting injury prevention and rehabilitation, providing effective claims administration, including payment of entitlements, and provide rehabilitation for all work-related injuries and illnesses.

The employer agrees to act in good faith and consult with ACC when necessary, and to supply information to ACC when requested.

Employees are entitled to seek an independent review of claims management decisions. In that case, ACC will provide an independent reviewer, to be paid for by the employer.

Monitoring

Employers are required to support active monitoring and audit by ACC. This includes:

- provision of monthly claims data
- annual self assessment using audit standards
- annual independent verification audit of programme standards
- annual review of financial information.

Role of Third Party Administrators

Employers can use a third party administrator to assist with workplace injury management. In such cases employers are required to maintain an involvement in all claims, and remain ultimately responsible for these claims. Details of the relationship with the TPAs must be disclosed to ACC.

Audit approach and standards

Although ACC publishes separate standards for the ACC Partnership Programme to the Workplace Safety Management Programme, they are very similar to the WSMP ones described on page 4 above. So again the audit is based on compliance rather than outcomes and provides for primary, secondary and tertiary levels.

Employers have an incentive to reach higher levels as the PDP discount they receive is applied on top of the corresponding WSMP discount.

Full Self-Cover Programme (FSC)

The Full Self-Cover Programme is a step up from the PDP in terms of the extent to which the employer bears responsibility for injury management. Employers effectively assume full financial responsibility for claims for the life of the claim, but management of the claim passes to ACC at the end of the agreed claims period (either 24, 36, or 48 months after the end of the claims year). The transfer of ongoing transferred to ACC is at an agreed price.

In return the component of the levy calculated to cover the expected cost of claims by the employer (based on levy risk group averages) is waived rather than discounted. As set out below, employers still have to pay other components of the levy.

Stop loss cover is mandatory, though employers can choose a cap in the range 160% to 250% of the risk. In addition, employers can optionally purchase High Cost Claim Cover (HCCC) to cap the cost of any individual event. It is available for a choice of \$250,000, \$500,000, \$750,000, \$1,000,000, \$1,500,000, \$2,000,000 or \$2,500,000.

Other details of the scheme – eligibility criteria, admission, roles of ACC, employer and TPA – are the same as for the PDP. The audit arrangements are also the same, but there is no direct financial incentive for employers to graduate from primary to secondary and tertiary levels.

How levies are set

FSC programme levies comprise the following components

- Partnership Programme Administration fee
- Unallocated Primary Health Cost charge
- Bulk-funded Public Health Cost
- Stop loss levy
- High cost claims cover (HCCC, optional)

The first two elements are the same as those of PDP1 & PDP2. We describe the remainder.

Bulk-funded public health cost

This is the portion of the public health acute services charges attributable to FSC members. It is apportioned on the basis estimated total liable earnings.

Stop loss levy and high cost claims cover

The stop loss cover optionally available under PDP is compulsory for FSC employers. It is available for any chosen amounts between 160% and 250% of the expected claims amount. For FSC this is the total claims costs for any claims year including any payment made to ACC at the end of the claims period.

High cost claims cover is available for individual events, and is available for amounts of It is available for a choice of \$250,000, \$500,000, \$750,000, \$1,000,000, \$1,500,000, \$2,000,000 or \$2,500,000.

Stop loss and high cost claims cover interact in that any HCCC claims are applied before the determination of any excess of the aggregate loss over the stop loss limit.

The levies are determined using empirical data based on historic claim sizes in the last 6 accident years with sufficient information available. The empirical data is translated into a model that uses empirical data for claims less than \$250,000 and a Pareto distribution for the tail of larger claims. (This approach is used because the Pareto distribution gives a poor fit for smaller claims).

Risk margins are applied to the stop loss limit cover as for the case of PDP. A risk margin is also applied for HCCC. Because of the volatility of very high cost claims associated with their limited number, a higher risk margin is applied for higher HCCC thresholds.

Residual costs of claims

Employers pay ACC for the residual cost of any open claims at the end of the claims period. In the event that closed claims are reopened, or incurred but not reported claims are made, while management is the responsibility of ACC, ACC can claim the costs from the employer.

Residual claims account

Prior to 1 July 1999, ACC was funded on a pay as you go basis, although in the lead up period the levy rate included an allowance to contribute to offsetting the existing deficits. Following the passing of the Accident Insurance Act 1998¹, this was changed to fully funded. As a result, employers pay – in addition to the Work Account levy described above – a residual account levy which is a transitional arrangement to cover run-off costs in relation to events prior to 1 July

¹ Now the Accident Compensation Act 2001. The current title has applied since March 2010.

1999. The combined Work Account and residual account levies together are referred to as the composite levy.

The residual account levy is currently around 30% of the composite (work account and residual account) levy. It finances run-off entitlements for people who would have been provided for under the Employers' Account under the Accident Rehabilitation and Compensation Insurance Act 1992. This covers

- work injuries suffered before 1 July 1999 and
- non-work injuries to earners suffered before 1 July 1992.

Residual levies are applied to all employers regardless of whether they are in a Partnership Programme or not.

The process for approving the residual levy is the same as for the Work Account. There is a statutory requirement that the cost of residual claims in the Residual Claims Account will be fully funded by the year 2019. This was extended by parliament from an earlier date of 2014 in March 2010.

ACC's funding policy

The policy is to set levies so as to have:

- assets equal to 105% of the outstanding claim liability provision by 30 June 2014
- a risk margin that gives a 75% probability that the liability provision is adequate.

Levies are intended to cover claims handling expenses.

Funding adjustment

This policy means that the principle determinants of the levy are analogous to those of the funding adjustment of the Work Account.

Risk Rates

As for the Work Account, the levy rate is adjusted for risk groups. For the Residual Claims Account, a smaller number of 'Residual Risk Groups' (RRGs) are used to maintain creditability (and thus stability in the rates) given the declining number of claims.

The risk rates are applied only to the element of the levy covering work related injuries, as non-work injuries are not industry risk related.

To reduce volatility in run off, and because current relativities are only approximations to pre 1999 relativities, the risk relativities have been frozen from the 2006/07 levy year.

Appendix 2: Description of data analysis

This Appendix sets out information on the data received and the analyses completed.

Approach

It was decided that in order to complete an independent review of the experience of accredited employers with the standard employers it was necessary to request and receive information direct from the ACC Data Warehouse. An alternative approach to the project would have been to receive data in respect of accredited employers and look to compare our analyses with work and results already completed by ACC in regard to the Work Account. This though would have led to innumerable questions on whether we were comparing like with like.

Requested data specification

To complete the required analysis we requested a dataset with the following key fields:

Employer data

- Unique employer identifier
- Cover year
- Accredited employer identifier
- Plan (Full Self Cover / Partnership Discount Plan)
- TPA service level
- H&S discount
- Classification Unit
- Liable earnings by classification unit

Claims data

- Unique claim identifier
- Employer identifier
- Classification Unit
- Injury date
- Reported date
- First treatment date
- Claim status
- Claim acceptance status
- Injury description

- Injury site
- Gradual process indicator

Payments data

- Unique claim identifier
- Payment date
- Payment amount
- Payment type

Actual data received

For the reasons set out in Part One - Limitations the requested dataset was not released by ACC. Instead the following limitations were applied by ACC:

- The industry identification of each employer was not disclosed.
- The classification units (CU) of each employer were not disclosed: instead employers (and hence claims) were split into 19 Standard Levy Bands based on the 2009/10 standard levy rates.
- No information on claims management period was provided.
- The TPA service level for accredited employers was reduced to either “TPA Managed” or “Self-managed”. Individual TPA details e.g. name were not provided.
- Payments data was aggregated by payment quarter.
- To enable us to identify the larger employers an indicator was included which identified all the employers in the top 10% of liable earnings (as at the 2008/09 cover year) and with their business spread across multiple classification units.
- No data was provided in respect of “serious” claims.

Full details on the data received are included in Appendix 4.

An earlier dataset was received where the employers were grouped by 2-digit ANZSIC code. However it was soon apparent that there were major problems with using this data such as over 30% of the claims grouped into one non specific employer group making it impossible to link back to the employer data. Minimal analysis of the data was attempted. The basis for ACC limiting the data released is set out in Part One – Limitations.

Sources of data

All the main data extracts were received via email from ACC’s Product, Pricing and Distribution Department in the form of zipped .tab text files.

ACC also supplied several summary spreadsheets e.g. table showing the distribution of employers by standard levy.

Issues in respect of the data

Monthly transfer of data to ACC

Accredited employers are required to provide to ACC a monthly dataset in regard to their claims.

The required dataset is extensive in order to meet the needs of ACC recording all the transactions in regard to a claim. The use of this data by ACC will vary depending on whether the accredited employer is in the PDP or FSC. For the former, ACC will need to include provision in its accounts for the claims liability after the end of claims management period. This is not the case for the FSC where the accredited employer retains full liability for the cost of the claims beyond the claims management period. The exception to this is the liability in respect of the stoploss and High Cost Claims Cover insurance options offered by ACC.

Claims lodged both by the accredited employer and by ACC

Under the PDP, ACC takes over the claims management and is responsible for the full future costs arising on all claims. We understand ACC assigns a new claim number to such claims while retaining details of the injury date and including the employer identification for such claims and similarly for those FSC claims that are handed back to ACC at the end of the claims management period. In addition, we understand that claims are sometimes lodged by an employee both with their employer and direct with ACC.

After some initial summary results were provided to ACC, they provided a table containing a claim number mapping for all claims that had been lodged both by the accredited employer and by ACC. This table contained approximately 12,000 records. In attempting to link the claims we found that in some cases employer data was inconsistent between the multiple claim records and in other cases we were not able to link to the employer data at all. Due to the difficulties that arose and the relatively small number of claims involved we elected not to link such claims in the analysis completed for earlier versions of this report. While we understand this to be consistent with the approach taken by ACC in producing the statistics in the Employer Performance Reports for accredited employers we have taken account of the duplication for this final version. All results have been updated with the exception of those in respect of claim rates for which the impact of the duplicated claims was minimal (as established by multivariate analysis).

Details of how the inconsistencies in both the employer and claims data were treated are given in Appendix 4: Data received.

Unallocated claims and bulk health costs

The data includes a high number of claims where ACC has been unable to identify the employer concerned. This includes GP costs. We understand that the costs in regard to medical treatment at the emergency units of public hospitals are not included in the data.

While we might expect that medical claims with no employer identification might not be the subject of further investigation, we would not expect this to be the case for weekly compensation claims where the costs incurred are higher.

Claims lodged or reopened post handback

In order to fully assess the costs to an accredited employer in the FSC it is important that ACC allocate the costs back to the employer where claims reopen or are not reported until after the end of the claims management period. These costs would be met by ACC where an employee has left the employer concerned. We have presumed that these costs are allocated in full to accredited employers.

Inherent issues when comparing the data between accredited and standard employers

The data in respect of the standard and accredited employers is entered by different agencies and so could therefore be subject to interpretation in certain fields. ACC were asked if they were aware of any inherent bias in the claims data. Their response was that they were not aware of any such bias.

Grouping by injury site and diagnosis

For each claim the injury site and diagnosis were supplied. Our analyses required this information at a higher level than was provided so (for example) some injury sites were aggregated with similar injury sites. The grouped level data is shown in Appendix 5.

Liabile earnings

ACC does not hold information in respect of the number of employees for each employer. Instead, liable earnings are taken as a proxy for the level of exposure. This figure is the total earnings subject to the maximum cap applicable to each year. The current cap is \$110,000.

Movement of employers in and out of the ACCPP

Whether an employer was an accredited employer for a cover year was determined as at each 1 April and this indicator was applied to all claims arising in that year. If an accredited employer subsequently left the ACCPP the claims continued to be treated as belonging to an accredited employer for the remainder of that cover year.

Data classification

Because of the problems raised by ACC, it was determined that the best way to meet the requirement of capturing the level of risk experienced by employers was to classify the employers by their standard levy rate. The classification was as follows:

- Split the total liable earnings for all employers into 19 groupings referred to later as SLBs (standard levy bands).
- Each group has a similar level of liable earnings and because of this adjacent groups may include CUs with the same standard levy rate.
- This overlap was not of concern as the SLBs are grouped and the analysis focuses on the SLB grouping results.

The range of rates for each SLB is shown in the table below. For some summary results, the 19 groupings were further grouped into three to provide a clear categorisation of the risk groupings. The multivariate analysis used the full 19 groups with an adjustment factor for SLB 19 where some anomalies were identified.

Table 1: Standard Levy Band (SLB) ranges

SLB	Rate range \$ per \$100 LE	Mean rate \$ per \$100 LE
1	0 - 0.04	0.03
2	0.05 - 0.07	0.07
3	0.08 - 0.16	0.12
4	0.18 - 0.18	0.18
5	0.19 - 0.19	0.19
6	0.2 - 0.2	0.20
7	0.21 - 0.21	0.21
8	0.22 - 0.39	0.30
9	0.41 - 0.47	0.44
10	0.48 - 0.53	0.50
11	0.54 - 0.57	0.56
12	0.59 - 0.78	0.67
13	0.81 - 0.87	0.84
14	0.88 - 1.1	0.98
15	1.12 - 1.25	1.19
16	1.26 - 1.79	1.52
17	1.81 - 2.19	1.99
18	2.2 - 7.46	2.91
19	8.06	8.06

While each SLB has similar aggregate liable earnings it is the results of the higher SLBs which are most interesting as they are the higher risk groups with the most claims.

Data validation

A small number of tests against external data sources were completed to provide assurance that the data was of reasonable quality. The actual data was subject to detailed discussions with ACC on its validity

Number of claims

Based on the data provided, the total number of accepted claims for the year ending 31 March 2009 (before taking account of claims lodged more than once) was 193,014. This compared with 190,495 registered claims stated in the ACC June 2009 annual report. The number of claims for the years ending 31 March 2008 and 31 March 2007 (before taking account of claims lodged more than once) were 203,305 and 206,860 respectively.

Payments made

Payments made in regard to the standard employers were compared with the amounts in the ACC annual accounts. Up to March 2007 the employer claims were allocated to the Employer Account and have since been allocated to the Work Account, along with self-employed claims.

The payments figures from the dataset provided were consistently lower than the amounts in the annual accounts. This was not discussed with ACC but one reason is that the bulk health payments made by the accounts are not recorded in the payments file. In the comparisons, allowance was made for the payments to the self employed in the Work Account in the last 3 years.

Reliances and limitations

A great deal of reliance has been placed on the discussions with ACC personnel as to the quality of the data. There are some important issues in respect of the quality of the data and to what extent proper comparisons can be made. The work completed has resulted in some improvement in the comparative results of standard employer claims as published by ACC. As noted above there are a large number of claims which cannot be properly allocated to an employer and/or CU classification. If these claims were allocated we might see different results from those presented.

Analysis completed

Purpose

The purpose of the analysis was to compare and contrast the results of the accredited employers with the standard employers and to explain as far as possible the differences in the results observed.

While it was our intention to use multivariate regression (see section below) to identify the significant factors that can be used to predict the average cost of a claim and its duration as well as the claim rate for all claim types, we have, due to time constraints, only completed a regression model for the cost of Weekly Compensation claims.

A series of 2 and 3-way results tables have also been produced to compare accredited and standard employers. We stress that these results are shown for interest only and in some instances there may be factors interacting which drive the observed 2 and 3-way results. Because of this, some of these results support the corresponding multivariate analysis, while others do not.

The data was analysed as at 31 December 2009 to allow for the delays in updating the data warehouse for accredited employer claims.

Main risk factors

The factors which differentiate employers are summarised in the table below:

Risk factor	Measure	Comments
Risk level	Standard levy band	The higher the risk level, the greater the potential return to the organisation from investing in injury prevention and management. Accordingly, industries with high potential risk may see significant variation in outcomes.
Employer size	Liabile earnings	The higher the liable earnings, the larger the organisation and the greater its ability to invest in injury prevention and management. This includes the important function of the employer providing effective part duties.
Standard levy	Liabile earnings	The greater the standard levy, the greater the incentive for the employer to reduce costs.
H&S discount	WSD/WSDMP discount	All accredited employers' injury prevention processes are audited and employers are given a discount on the standard levy of 10%, 15% or 20%. The higher the discount the better the expected outcomes.
Injury Management	ACC / accredited	

Approach

The principal analysis completed was in respect of the following:

- average cost of a claim
- the duration of claims
- the frequency of accidents, the claim rate

The following approach (in respect of the 2 and 3-way analyses) was adopted:

- comparisons were made at a high level, comparing the outcomes of accredited employers and standard employers
- further comparisons were made at a lower level and included splitting the outcomes further by liable earnings, SLB, and H&S discount.

Multivariate regression

The approach described above provides a useful starting point in understanding the factors which influence the claims outcomes. However, due to the large degree of heterogeneity present in the data a more complex analysis is required to isolate individual effects. It is also likely that there are interactions and correlations between the factors and the separate one way analyses may be hiding a common underlying effect.

Multivariate regression is a statistical analysis that seeks to isolate the effect of each subdivision while taking into account all other subdivisions at the same time. For example, a multivariate regression analysis might seek to quantify the difference in the average claim size for accredited employers compared to standard employers, while allowing for the fact that accredited employers will generally be in the riskier Classification Units and will be larger than standard employers.

Paid to date

All payments made to date were included in the model with projections for claims not yet finalised. Projections were calculated using traditional survival techniques.

Impact of surplus in Work Account

The analysis compares the claims experience but has not taken any account of the level of the levies which an employer will have paid. With the surplus in the Work Account reducing the levy rates for the period 1 April 2007 to 31 March 2010 an employer may have been advantaged paying the standard levy rather than self insuring even given lower claims experience. This impact is seen in the reduction in the number of employers in the ACCPP from 167 as at 31 March 2007 to 139 as at 1 April 2009.

Cover periods

The analysis allowed for the impact of the different development periods i.e. for the first cover period ending 31 March 2001 there are 9.75 years claims development.

PDP and FSC

The multivariate analysis treated both self insurance options as a single factor. Similarly, our 2 and 3-way tables consider the results for each option separately.

ACC's levy basis

The results have been sorted by standard levy rate and accordingly the level of risk categorisation is as determined by ACC. As expected the average claim size and claim rates support ACC's standard levy rating.

Claims administration costs

The analysis does not consider the impact of differences in the cost to an employer of the claims administration costs. It is possible that while an accredited employer may achieve better results from self management, the benefits are somewhat dissipated if the cost of managing the claims is unduly high.

Appendix 3: Data findings

Introduction

This Appendix provides details on the results of the analysis. The Appendix is split up into five sub sections:

- **Review of the basic data set** provides various summaries of the data provided.
- **Average claim size** presents the full results of the average claim size multivariate regression model as well as numerous additional 2 and 3-way results tables
- **Claims duration** presents the full results of the average duration multivariate regression model as well as some summary 3-way results tables.
- **Claims rates** presents the full results of the average claim rates multivariate regression model as well as numerous additional 2 and 3-way results tables.
- **Other results** shows a number of additional miscellaneous results of interest.
- **Possible future analysis** outlines some suggested further analyses that we consider would be of value.

Review of basic dataset

This section presents information on the number and value of claims on which the subsequent analysis is based. The results shown are in respect of the period from 1 July 2000 to 31 December 2009.

Claims have been classified as Medical Only, Weekly Compensation or Other Entitlement. A Medical Only claim is one for which the only payments in respect of that claim are for medical treatment or elective surgery. A Weekly Compensation claim is one for which at least one weekly compensation payment has been made. An Other Entitlement claim is one for which at least one rehabilitation, independence allowance or death benefit payment has been made but no weekly compensation payments made.

Table 2 below splits the results by the claim status, whether or not a payment was made on the claim and shows the number of claims and amount paid.

Table 2: Number of claims and amount paid to date

Claim acceptance status	Number of claims	Paid to date (\$000s)
Accepted		
Payment made	1,729,325	2,482,256
No payment made	193,504	0
Total	1,922,829	2,482,256
Declined		
Payment made	85,138	58,880
No payment made	192,454	0
Total	277,592	58,880
Other		
Payment made	6,086	3,157
No payment made	79,078	0
Total	85,164	3,157
Total	2,285,585	2,544,293

The table shows a high number of accepted claims on which no payment was made and a similarly high number of declined claims.

Table 3 below shows the number of claims and the payments made to date on all claims split by claim type and the reason why it was not possible to link the claims to employer data.

Table 3: Details for claims which could not be matched to an employer

Claim Type	Number of claims No			Paid to date (\$000s) No		
	Employer ID	Linking Issue	Total	Employer ID	Linking Issue	Total
Medical Only	444,824	219,510	664,334	64,305	24,673	88,977
Weekly Compensation	23,281	25,310	48,591	210,977	181,153	392,130
Other Entitlement	35,087	6,515	41,602	163,162	10,840	174,003
Total	503,192	251,335	754,527	438,444	216,666	655,110

'No Employer ID' refers to claims for which an employer ID number was not provided. Note that because of the way the employer ID was generated (a unique combination for every employer and CU combination), the 'No Employer ID' claims also include some claims for which the employer was known but the CU entered was invalid e.g. the claim was allocated by ACC to the default CU. 'Linking issue' refers to claims for which an employer ID number was provided but we were unable to link this number into the employer data for the claim cover year.

Table 4 below shows the same details as the previous table but is only in regard to those claims that were accepted and for which at least one payment was made.

Table 4: Details for claims which could not be matched to an employer (in respect of accepted claims where a payment was made)

Claim Type	Number of claims No			Paid to date (\$000s) No		
	Employer ID	Linking Issue	Total	Employer ID	Linking Issue	Total
Medical Only	358,005	135,911	493,916	60,627	22,331	82,958
Weekly Compensation	22,987	24,967	47,954	208,667	177,996	386,663
Other Entitlement	33,169	5,178	38,347	160,359	8,774	169,132
Total	414,161	166,056	580,217	429,653	209,101	638,754

In the report where we cannot allocate a claim to an employer for whatever reason the claims are referred to as unallocated employers (UEs) claims. Standard and accredited employers are referred to as SEs and AEs respectively.

The results that follow (unless otherwise stated) are in respect of accepted claims for which at least one payment has been made.

Table 5: Number of accepted claims by claim type

Claim Type	Number of claims			Total
	SE	AE	UE	
Medical only	746,493	193,572	493,916	1,433,981
Weekly compensation	130,502	39,540	47,954	217,996
Other entitlement	26,043	12,958	38,347	77,348
Total	903,038	246,070	580,217	1,729,325

The total number of accepted claims each year has varied from 177,513 in 2001/02 to 193,260 in 2005/06 to 173,086 in 2008/09.

Table 6: Paid to date for accepted claims by claim type

Claim Type	Paid to date (\$000s)			Total
	SE	AE	UE	
Medical only	113,055	39,317	82,958	235,330
Weekly compensation	1,327,913	282,892	386,663	1,997,468
Other entitlement	52,614	27,711	169,132	249,458
Total	1,493,581	349,920	638,754	2,482,256

The total amount paid to date on the accepted claims each year has varied from \$227m in 2001/02 to \$320m in 2006/07 to \$265m in 2008/09.

The accredited employers make up 14% of the total number of claims and 14% of the amounts paid.

Table 7 below shows the acceptance rates for all claims including claims where no payment was made. We have taken the decline rate as the difference between 100% and the acceptance rates.

Table 7: Claim acceptance rates by claim type

Claim Type	Claim acceptance rate			Total
	SE	AE	UE	
Medical only	94%	57%	84%	82%
Weekly compensation	100%	96%	99%	99%
Other entitlement	86%	75%	92%	87%
Total	94%	61%	85%	84%

The results show accredited employers with lower acceptance rates than standard employers particularly in respect of medical only claims. The low acceptance rates for accredited employers are understood to be due to a number of reasons some of which are noted in Appendix 2.

A breakdown of the rates by cover period and by claim type is included in the section on “Other Results”. The rates for accredited employers and unallocated employers vary over time; which may highlight problems with how the claims are initially processed.

The table below shows the paid to date split by payment type (not claim type).

Table 8: Paid to date split by payment type

Payment Type	Paid to date (\$000s)			Total
	SE	AE	UE	
Medical	246,829	87,507	157,957	492,292
Weekly compensation	939,915	184,612	268,948	1,393,475
Other	306,838	77,802	211,849	596,488
Total	1,493,581	349,920	638,754	2,482,256

The accredited employers make up 18% of the medical payments and 13% of the weekly compensation payments.

Details of the “other” payments are in Table 9 below.

Table 9: Paid to date: analysis of ‘Other’ payments

Payment Type	Paid to date (\$000s)			Total
	SE	AE	UE	
Elective surgery	127,836	39,111	49,484	216,431
Social rehab	38,136	16,098	110,187	164,422
Vocational rehab	74,520	9,009	17,066	100,595
Residual*	66,345	13,583	35,111	115,040
Total	306,838	77,802	211,849	596,488

* Residual = Death grants and compensation + Independence allowances, lumps sums & other rehabilitation

The accredited employers make up 18% of the elective surgery, 10% of the social rehabilitation, 9% of the vocational rehabilitation and 12% of the residual payments.

Table 10: Number of claims and amounts paid to date by SLB grouping

Standard Levy Bands	Number of claims				Paid to date (\$000s)			
	SE	AE	UE	Total	SE	AE	UE	Total
1 - 6	52,950	13,574	0	66,524	58,096	17,945	0	76,041
7 - 12	246,153	75,351	0	321,504	304,681	86,164	0	390,846
12 - 19	603,935	154,882	0	758,817	1,130,804	227,810	0	1,358,614
Unknown	0	2,263	580,217	582,480	0	18,001	638,754	656,755
Total	903,038	246,070	580,217	1,729,325	1,493,581	349,920	638,754	2,482,256

The results show the higher the standard levy rate the greater the number of claims and the payments made. This is to be expected as the standard levy groups with the higher rates are the more risky groups. This applies equally to standard and accredited employers i.e. there is no undue concentration of accredited employers in any of the SLB groupings.

Table 11 below shows the results by liable earnings bands. ACC does not collect data on the number of full time employees and instead we have used liable earnings as a proxy for the size of an employer.

Table 11: Number of claims and amounts paid to date by liable earnings

Liable earnings (\$m)	Number of claims				Paid to date (\$000s)			
	SE	AE	UE	Total	SE	AE	UE	Total
< 1	464,493	5,044	0	469,537	816,292	7,094	0	823,386
1 - 10	328,371	21,961	0	350,332	519,031	28,226	0	547,257
10 - 100	102,667	80,999	0	183,666	152,153	109,175	0	261,328
> 100	7,507	135,803	0	143,310	6,105	187,424	0	193,530
Unknown	0	2,263	580,217	582,480	0	18,001	638,754	656,755
Total	903,038	246,070	580,217	1,729,325	1,493,581	349,920	638,754	2,482,256

The results illustrate the different risk profiles of the standard and accredited employers by size of employer. There are few standard employer claims in the top liable earnings group while the accredited employers have a high number in this group i.e. illustrating that the accredited employers are the larger employers.

The small number of claims for accredited employers with liable earnings of less than \$1 million is due to how the data was provided for the review.

Summaries of the number of claims and amounts paid to date by acceptance status and payments made are shown in Tables 12 and 13 below.

Table 12: Summary of number of claims by employer

Claim acceptance status	Number of claims			Total
	SE	AE	UE	
Accepted				
Payment made	903,038	246,070	580,217	1,729,325
No payment made	79,217	51,834	62,453	193,504
Total	982,255	297,904	642,670	1,922,829
Declined				
Payment made	32,382	24,283	28,473	85,138
No payment made	16,825	119,250	56,379	192,454
Total	49,207	143,533	84,852	277,592
Other				
Payment made	1,868	2,314	1,904	6,086
No payment made	10,545	43,432	25,101	79,078
Total	12,413	45,746	27,005	85,164
Total	1,043,875	487,183	754,527	2,285,585

Table 13: Summary of payments made to date by employer

Claim acceptance status	Paid to date (\$000s)			Total
	SE	AE	UE	
Accepted				
Payment made	1,493,581	349,920	638,754	2,482,256
No payment made	0	0	0	0
Total	1,493,581	349,920	638,754	2,482,256
Declined				
Payment made	18,443	24,821	15,616	58,880
No payment made	0	0	0	0
Total	18,443	24,821	15,616	58,880
Other				
Payment made	850	1,566	740	3,157
No payment made	0	0	0	0
Total	850	1,566	740	3,157
Total	1,512,875	376,308	655,110	2,544,293

Tables 12 and 13 illustrate the high number of accepted claims with no payments (193,504) and the payment amounts made on declined claims (\$58,880k).

Average claim size

As noted previously, we are considering accepted claims for which at least one payment has been made. Results for unallocated employer claims where it was not possible to identify the employer as being accredited or standard (UEs) have been included for completeness.

Table 14: Average claim size by claim type and cover year

Claim Type	Cover Year						Total
	2000/01	2002/03	2004/05	2006/07	2008/09	2009/10	
	\$	\$	\$	\$	\$	\$	\$
Medical only							
SE	119	118	141	174	206	172	151
AE	145	150	187	251	300	232	203
UE	122	133	157	188	231	208	168
Total	124	127	153	189	226	189	164
Weekly compensation							
SE	9,750	10,258	10,692	11,779	9,817	5,413	10,175
AE	7,729	7,394	7,081	7,313	6,622	3,447	7,155
UE	8,357	7,711	7,934	8,881	8,738	4,623	8,063
Total	9,022	9,228	9,430	10,343	8,982	4,923	9,163
Other entitlement							
SE	1,948	2,171	1,847	1,982	1,299	934	2,020
AE	1,704	1,783	1,994	2,714	2,369	1,244	2,139
UE	4,929	4,746	4,644	4,331	3,910	3,125	4,411
Total	3,448	3,296	3,317	3,271	2,812	1,907	3,225
All claim types							
SE	1,401	1,550	1,774	2,103	1,662	791	1,654
AE	1,210	1,369	1,428	1,588	1,561	789	1,422
UE	1,029	1,059	1,091	1,204	1,310	749	1,101
Total	1,234	1,380	1,493	1,712	1,530	778	1,435

In interpreting Table 14 it should be noted that claims values in respect of more recent cover years are reduced due to the lower number of settlement years.

The results show the overall average claim size for an accredited employer is 86% of a standard employer. For the 2000/001 cover year the average accredited employer claim size was around 86% of the average standard employer claim size. The results of standard and accredited employers diverge with cover year until 2006/07 where the average claim size of accredited employers is 76% of that for standard employers. The difference reduces for the more recent cover years. We comment on the reasons for these results later.

ACC publishes results annually in the accredited employers’ performance reports on the average size of claims in the Work Account. In the table below we compare the results in this report with figures produced by ACC based on the data set supplied for this project.

Table 15: ACC calculated average claim size by employer type and cover year

	Cover Year						Total	Total excl. 2009/10
	2000/01	2002/03	2004/05	2006/07	2008/09	2009/10		
	\$	\$	\$	\$	\$	\$	\$	
Report								
SE	1,401	1,550	1,774	2,103	1,662	791	1,654	1,722
AE	1,210	1,369	1,428	1,588	1,561	789	1,422	1,453
ACC								
SE	1,402	1,545	1,763	2,083	1,716	n.a	1,724	1,724
AE	971	1,101	1,242	1,508	1,564	n.a	1,294	1,294

A comparison shows the numbers produced for this report are \$1,722 and \$1,453 for standard and accredited employers respectively. The equivalent ACC produced results are \$1,724 and \$1,294 i.e. the results are very similar for the standard employers but very different for the accredited employers. The variance will be mainly due to claims lodged more than once. A full explanation of these claims is included in Appendix 2, “Issues in respect of the data”.

Multivariate analysis

The purpose of the multivariate analysis was to analyse the large number of potential factors that could be skewing results shown above – such as the underlying mix of standard levy band (SLB) or employer size. The model solely looked at the differences in the Weekly compensation claim size.

The model built to complete the analysis is a multivariate survival regression. It uses the logarithm (log) of closed claim size due to the large proportion of open claims in later cover years and the highly skewed nature of the underlying distribution. The log transformation means the results are set out on a multiplicative basis and refer only to the median claim size.

The multivariate analysis identified the following key drivers for claim size:

- Employer type (AE vs. SE)
- Claim type (e.g. amputation, burn, etc.)
- Cover year
- Standard levy band (SLB)
- If the claim was from a “large employer” (employer with liable earnings in top 10% of all liable earnings)

- Liable earnings per SLB
- Length of time claim took to finalise (duration)
 - Short (≤ 3months)
 - Medium
 - Long (≥ 24 months)
- Discount Group

The model was designed to provide an indication of trends and direction of effects, not as a prediction tool.

All of the above factors provided very strong evidence against the hypothesis that their effect was due to random variation. After taking the effects of the above factors into account there was no evidence that other factors such as third party administrators were of any added help in explaining the variation in claim size.

Quantifying the above effects is tricky due to the large number of “interactions” present in the data. Here interaction is taken to mean the effect on claims cost of one factor (e.g. SLB) is dependent on the level of another factor (e.g. whether the employer is an AE or SE). It should also be noted that there were a large number of additional interaction effects present in the data which were chosen to be ignored due to the non trivial added complication which they produce.

Quantifying the model results

The following table sets out the relative effects of changing various risk factors from an accepted amputation or concussion accredited employer claim in 2001 with a 0% discount, not a large employer, with liable earnings of \$1, SLB = 0, that settles within three months. It should be noted that the above claim type is impossible in practice – it is for comparison purposes only.

Table 16: Relativity Factors for the average claim size model

Employer Type		Large Employer Status = Yes	
Accredited	100%	Accredited	92%
Standard	981%	Standard	88%
IDC		Claim Duration	
Amputation	100%	<i>Accredited Employer</i>	
Burns	43%	Short	100%
Concussion	119%	Medium	231%
Dental Injuries	67%	Long	817%
Foreign Body In Orifice/eye	34%	<i>Standard Employer</i>	
Fracture/dislocation	124%	Short	100%
Gradual process	176%	Medium	279%
Hernia	117%	Long	1572%
l/non-i Laceration,puncture,sting	55%	Discount Group	
Inhalation/ingestion Specific Occ.	101%	<i>Accredited Employer</i>	
n.a	81%	0%	100%
Occp.dis (ab/lead,bru,derm,hep,lep	61%	10%	66%
Other	151%	15%	53%
Soft Tissue Inj (contu,str,spr,int	136%	20%	43%
Acceptance Status		<i>Standard Employer</i>	
Accepted	100%	0%	100%
Decline	97%	10%	91%
Inflation Rate (p.a.)		15%	87%
Accredited	3%	20%	83%
Standard	4%	Log Liable Earnings	
Standard Levy Band Inflation		Accredited	9%
Accredited	3.4%	Standard	-6%
Standard	2.7%		

How to use the relativity factors

A fully worked example of how to use Table 16 above is given in Appendix 6. Some simple examples are given below:

Injury Diagnosis Category:

The model indicates that, holding all else constant, the median claim size in:

- Concussion claims are 19% larger than amputation claims
- Gradual process claims are 76% larger than amputation claims

Cover Year:

The model indicates that, holding all else constant, the median claim size increases by:

- 3% per annum for an AE
- 4% per annum for an SE

Discount Group:

The higher the discount the lower the median claims cost – however this effect is more pronounced for AEs.

Again we emphasise that the effects are not meant for claims prediction – just to indicate the direction of the effect of a particular risk factor and a best estimate as to their scale.

Below we have illustrated the results in respect of the main factors which determine the size of a claim and where there is a difference between accredited and standard employers. These factors are:

- Claim duration
- WSMP discount
- Cover period
- Whether a large employer as defined below.

We have also illustrated the results by standard levy band to show how the claim size changes.

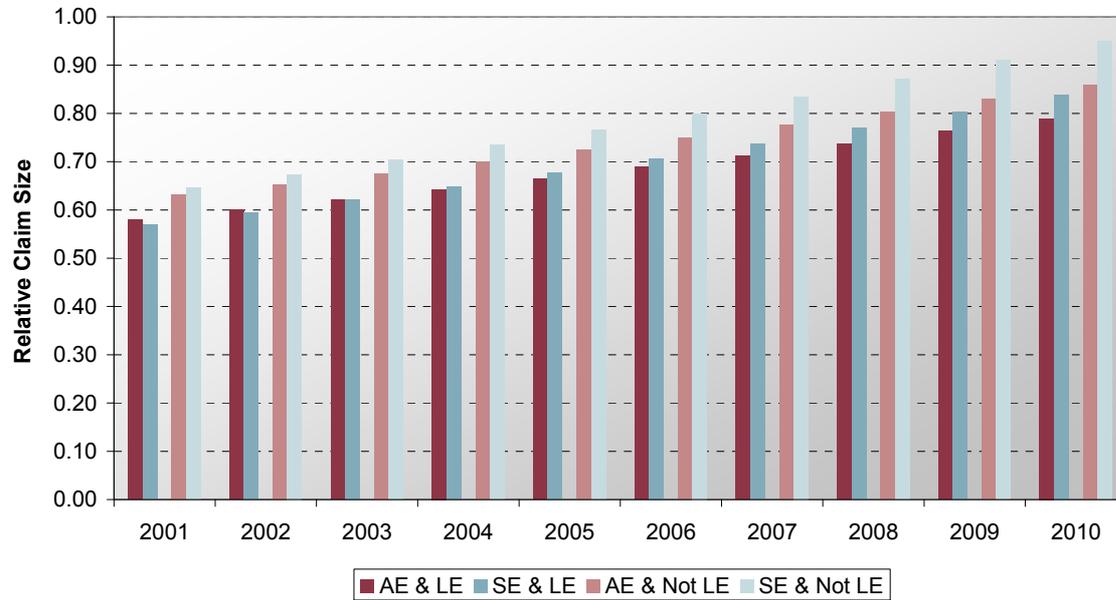
Illustrating the Model Results

In the charts below we have compared the median claim size for different employer types with liable earnings of \$40m in SLB 10 looking at first short duration, then medium duration claims and finally long duration claims and comparing the results for WSMP discount rate of 10% and 20%. The scale is set just for comparative purposes.

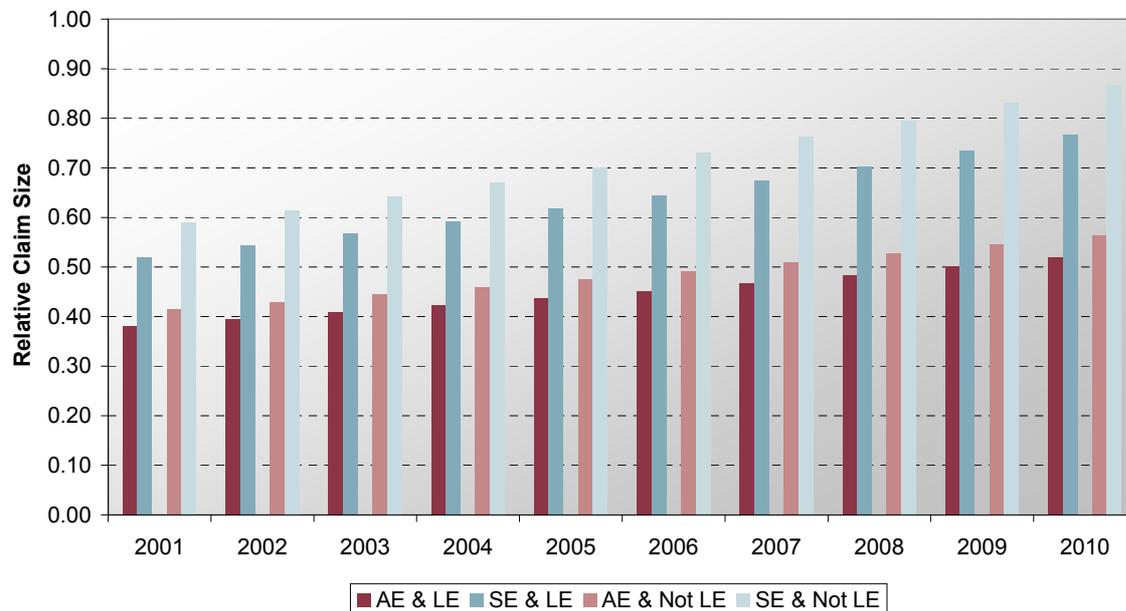
Note here “Large” refers to an employer who is in the top 10% of liable earnings and multiple classification units. Also the results for the short, medium and long durations cannot be directly compared to each other as the scale for each is different.

Figure 1: Modelled results: Median claim size for SLB10 short duration claims

10% WSMP discount



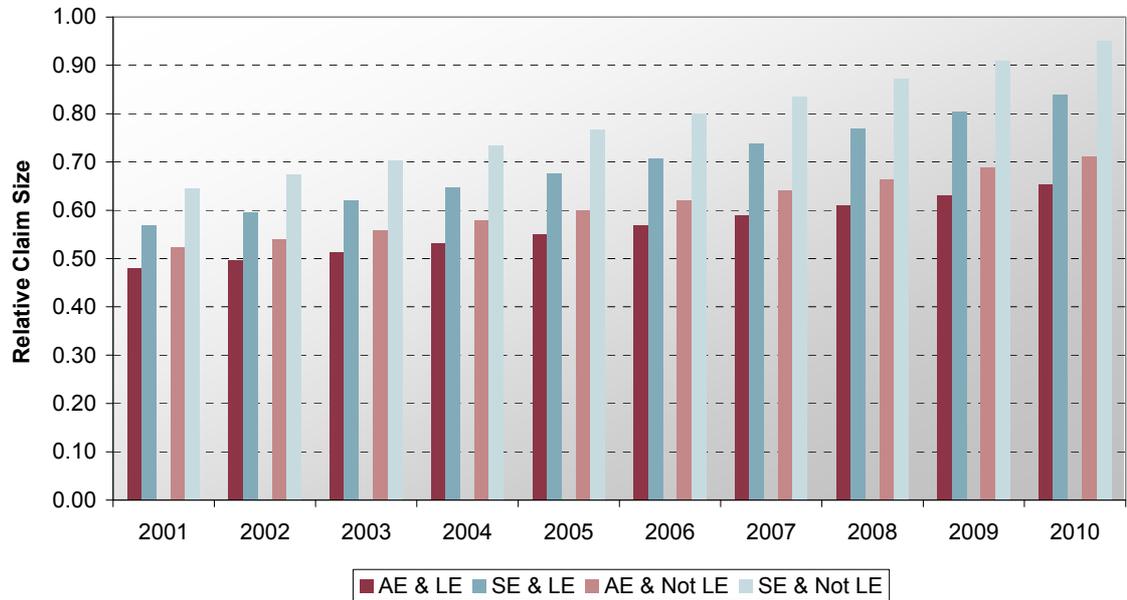
20% WSMP discount



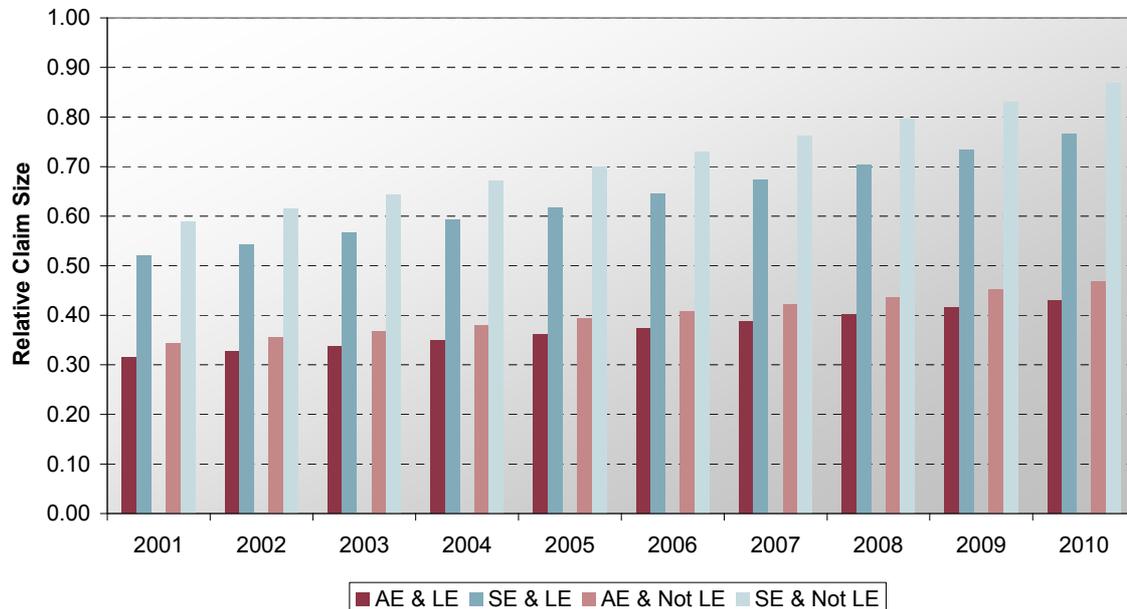
The charts illustrate how the greater the WSMP the greater the variance in the performance of accredited and standard employers.

Figure 2: Modelled results: Median claim size for SLB10 medium duration claims

10% WSMP discount



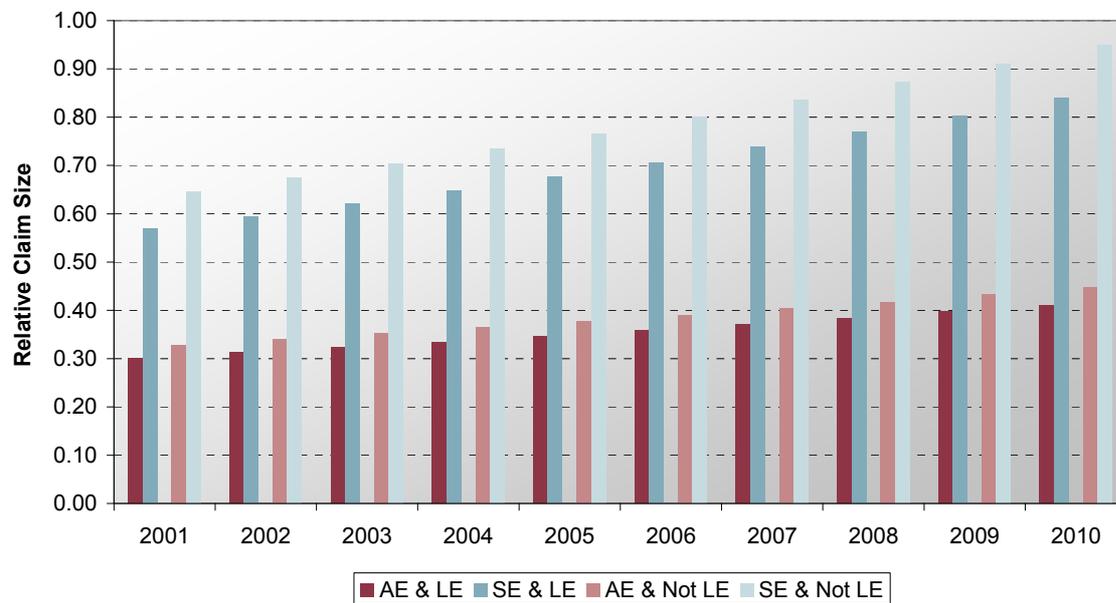
20% WSMP discount



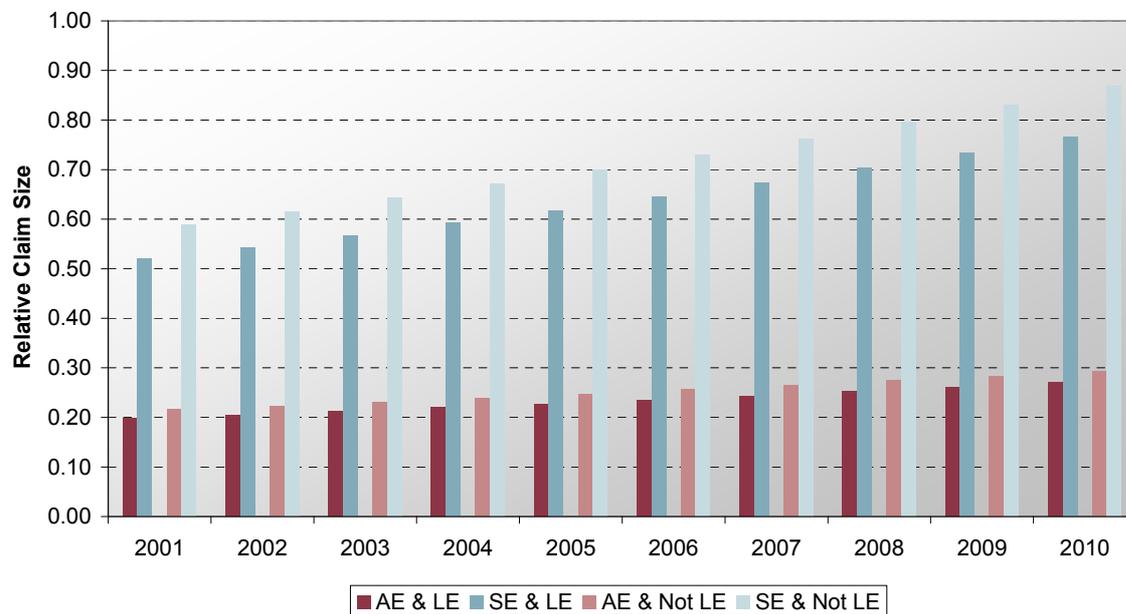
The charts show again the bigger the WSMP discount the better the accredited employer results.

Figure 3: Modelled results: Median claim size for SLB10 long duration claims

10% WSMP discount



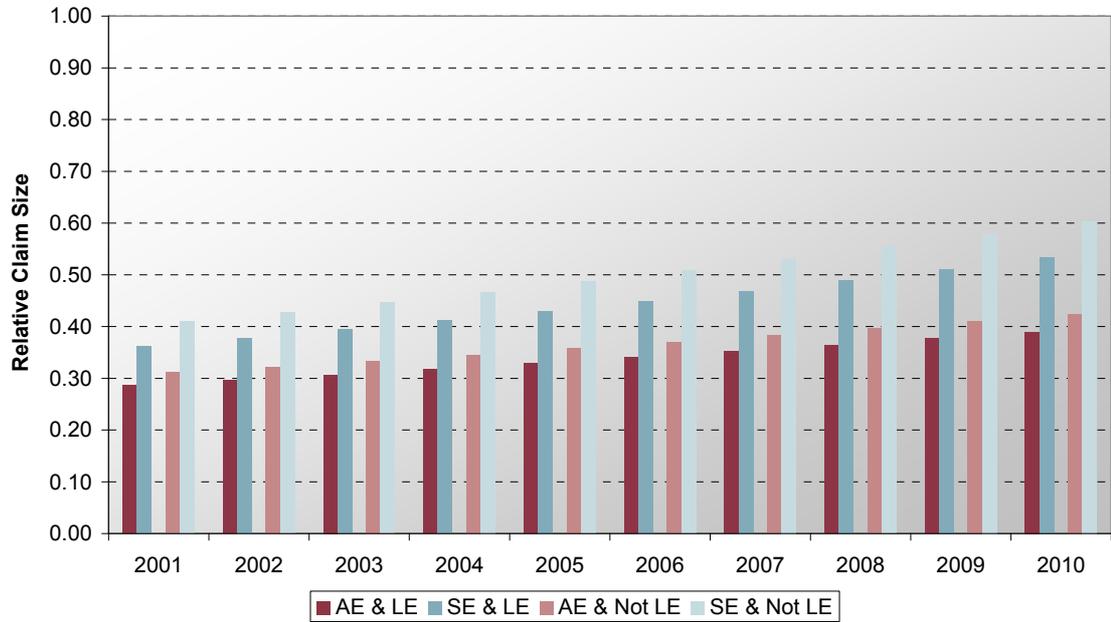
20% WSMP discount



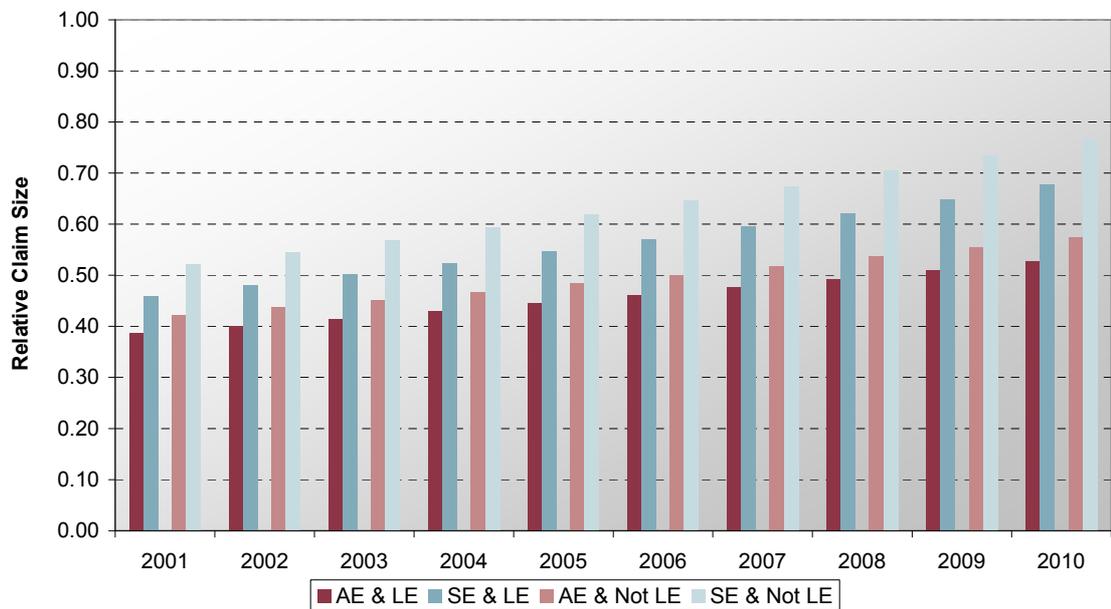
As before the charts show better outcomes for accredited employers the greater the WSMP discount.

Figure 4: Modelled results: Median claim size - medium duration claims with 10% WSMP

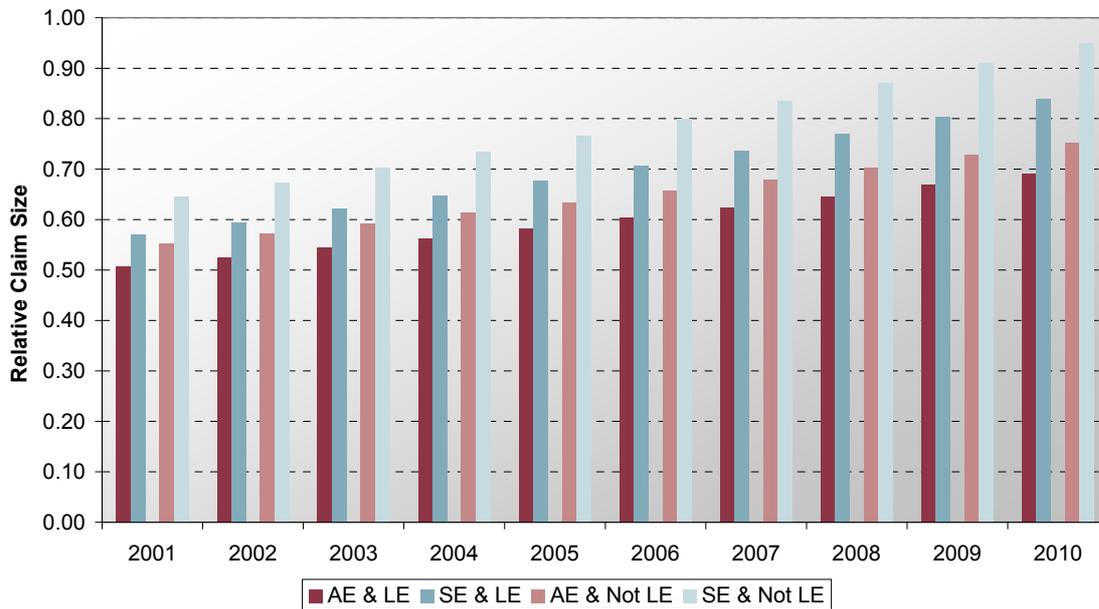
SLB 1



SLB 10



SLB 18



The three charts show how the greater the SLB the greater the cost of the claims and with similar outcomes as before between accredited and standard employers.

Further results

Here we include further results from our 2 and 3-way analyses. We again emphasise the importance of the results of the multivariate analysis over those presented here, which are shown for interest only. In some cases there may be factors interacting that drive the observed 2 and 3-way results and because of this, some of these results support the corresponding multivariate analysis, while others do not.

Table 17: Average claim size by duration

Claim Type	Average paid to date (\$) by duration (months)						
	0 - 3	3 - 6	6 - 9	9 - 12	12 - 24	24 - 36	36 - 48
Medical only							
SE	82	167	415	518	616	763	877
AE	93	186	370	541	659	681	541
UE	85	182	419	518	624	813	783
Total	84	175	407	523	628	759	739
Weekly compensation							
SE	1,328	2,873	6,672	10,120	17,332	30,524	41,604
AE	929	2,128	4,419	6,441	10,877	20,607	25,421
UE	1,110	2,445	5,669	8,924	14,853	25,434	34,582
Total	1,209	2,660	6,009	9,069	15,412	27,642	37,287
Other entitlement							
SE	423	644	1,190	1,912	2,680	5,634	9,139
AE	431	734	1,339	2,131	3,666	4,343	6,598
UE	486	915	2,670	3,689	4,715	6,329	7,528
Total	449	762	1,832	2,704	3,878	5,808	7,681
All claim types							
SE	159	633	2,564	4,195	8,242	17,199	24,638
AE	163	519	1,472	2,485	4,681	8,479	9,084
UE	131	419	1,586	2,653	4,994	9,096	10,654
Total	150	545	2,021	3,341	6,451	12,753	16,057

The results show a marked difference in the cost of longer duration claims between standard and accredited employers. For claims of duration 36 - 48 months the average claim size for standard employers is \$24,638 compared to \$9,084 for accredited employers. The table shows that accredited employers pay less on longer duration claims so that, over time, the relative average claim size for accredited employers reduces compared to standard employers. These results go some way to explaining the variance in the relative average claim sizes for as seen earlier in Table 16.

Table 18: Average claim size by SLB

Standard Levy Band	SE \$	AE \$	Total \$	AE / SE %
1	1,156	403	1,137	35%
2	916	996	942	109%
3	989	1,494	1,110	151%
4	1,106	1,568	1,257	142%
5	1,068	1,177	1,091	110%
6	1,306	1,568	1,313	120%
7	1,034	919	1,019	89%
8	1,158	811	1,098	70%
9	1,280	1,383	1,290	108%
10	1,364	1,052	1,185	77%
11	1,515	1,667	1,609	110%
12	1,254	924	1,220	74%
13	1,300	1,233	1,284	95%
14	1,451	1,481	1,458	102%
15	1,686	1,551	1,658	92%
16	1,824	1,490	1,786	82%
17	2,317	1,372	2,198	59%
18	2,237	1,602	2,073	72%
19	1,307	960	1,150	73%
n.a		7,954	1,128	
Total	1,654	1,422	1,435	86%

The results show that overall the claim size increases the higher the SLB with a less pronounced increase for the accredited employers; i.e. the standard employers have a steeper increase in the average claim size.

Table 19: Average claim size by liable earnings and SLB

Liable earnings (\$m)	Standard levy band			Total \$
	1 - 6 \$	7 - 12 \$	13 - 19 \$	
< 1				
SE	1,016	1,277	1,988	1,757
AE	374	1,009	1,573	1,406
Total	1,015	1,274	1,983	1,754
1 - 10				
SE	1,293	1,222	1,718	1,581
AE	1,363	977	1,319	1,285
Total	1,294	1,215	1,688	1,562
10 - 100				
SE	1,073	1,187	1,859	1,482
AE	1,123	970	1,485	1,348
Total	1,085	1,121	1,652	1,423
> 100				
SE	892	690	500	813
AE	1,399	1,217	1,495	1,380
Total	1,231	1,193	1,492	1,350
Unknown				
AE				7,954
UE				1,101
Total				1,128
Total	1,143	1,216	1,790	1,435

The overall results show average claim size decreases as liable earnings increase and as SLB decreases.

Table 20: Average claims size by SLB grouping and cover year

SLB	Cover Year						Total \$
	2000/01 \$	2002/03 \$	2004/05 \$	2006/07 \$	2008/09 \$	2009/10 \$	
1 - 6							
SE	1,151	1,083	1,122	1,528	1,087	477	1,097
AE	875	1,090	1,492	1,560	1,242	635	1,322
Total	1,065	1,085	1,191	1,534	1,114	502	1,143
7 - 12							
SE	890	1,195	1,346	1,643	1,245	603	1,238
AE	1,047	876	1,121	1,565	1,250	724	1,144
Total	931	1,118	1,294	1,625	1,246	625	1,216
13 - 19							
SE	1,631	1,728	1,998	2,339	1,894	910	1,872
AE	1,278	1,494	1,461	1,469	1,718	848	1,471
Total	1,553	1,680	1,878	2,156	1,859	902	1,790
Unknown							
AE	5,945	10,242	9,239	7,801	3,273	6,557	7,954
UE	1,029	1,059	1,091	1,204	1,310	749	1,101
Total	1,046	1,107	1,119	1,240	1,316	750	1,128
Total							
SE	1,401	1,550	1,774	2,103	1,662	791	1,654
AE	1,210	1,369	1,428	1,588	1,561	789	1,422
UE	1,029	1,059	1,091	1,204	1,310	749	1,101

An interesting result here is that the accredited employers have worse outcomes for the standard levy bands 1 to 6.

Table 21: Average claim size by H&S discount and SLB

H&S discount	Standard levy band			Total
	1 - 6	7 - 12	13 - 19	
	\$	\$	\$	\$
0%				
SE	1,120	1,260	1,901	1,672
AE	n.a	n.a	n.a	n.a
Total	1,120	1,260	1,901	1,672
10%				
SE	928	1,031	1,657	1,479
AE	1,420	1,154	1,629	1,408
Total	1,325	1,134	1,639	1,428
15%				
SE	1,086	1,136	1,786	1,586
AE	1,170	1,087	1,482	1,417
Total	1,122	1,121	1,635	1,509
20%				
SE	805	1,220	1,846	1,666
AE	819	1,112	1,174	1,156
Total	809	1,183	1,548	1,452
Unknown				
AE				7,671
UE				1,101
Total				1,128
Total	1,143	1,216	1,790	1,435

Table 21 shows that overall there is little variation in the claim size by WSMP level.

Table 22: Average claims size by H&S discount and liable earnings

H&S discount	Liable earnings (\$m)				Total \$
	< 1 \$	1 - 10 \$	10 - 100 \$	> 100 \$	
0%					
SE	1,752	1,565	1,444	799	1,672
AE	n.a	n.a	n.a	n.a	n.a
Total	1,752	1,565	1,444	799	1,672
10%					
SE	1,645	1,523	1,351	749	1,479
AE	1,566	1,307	1,428	1,418	1,408
Total	1,631	1,440	1,410	1,408	1,428
15%					
SE	2,032	1,625	1,513	857	1,586
AE	1,327	932	1,267	1,590	1,417
Total	1,783	1,592	1,381	1,509	1,509
20%					
SE	2,185	1,681	1,580	264	1,666
AE	224	1,422	1,197	1,132	1,156
Total	2,134	1,669	1,469	1,131	1,452
Unknown					
AE					7,671
UE					1,101
Total					1,128
Total	1,754	1,562	1,423	1,350	1,435

Table 22 shows that overall the average claim size decreases as liable earnings increases.

The table below compares two soft tissue back injuries. Care needs to be taken with the results as they rely on the accredited employers and ACC classifying claims the same.

Table 23: Average claim size for specific injuries

Injury Type	Cover Year						Total
	2000/01	2002/03	2004/05	2006/07	2008/09	2009/10	
	\$	\$	\$	\$	\$	\$	\$
Soft tissue injury - lower back							
SE	2,099	2,017	2,094	2,785	1,917	869	2,107
AE	1,265	1,462	1,425	1,666	1,467	641	1,480
UE	1,192	803	853	1,105	1,202	641	958
Total	1,658	1,604	1,600	2,071	1,641	785	1,657
Soft tissue injury - upper back							
SE	867	1,247	982	1,068	819	405	926
AE	670	875	925	709	717	467	807
UE	304	806	307	356	567	329	422
Total	632	1,081	752	773	730	387	745

There are significant differences in the results between standard and accredited employers. The variability of the cost of the claims was investigated by considering the standard deviation (expressed as a multiple) of the average claim size and the results are shown below.

Table 24: Variability of claim size of specific injuries

Injury Type	Cover Year						Total
	2000/01	2002/03	2004/05	2006/07	2008/09	2009/10	
	\$	\$	\$	\$	\$	\$	\$
Soft tissue injury - lower back							
SE	6	8	7	5	4	4	6
AE	8	8	8	5	4	3	7
UE	9	8	9	7	5	4	8
Total	7	8	8	6	4	4	7
Soft tissue injury - upper back							
SE	12	9	8	8	6	5	9
AE	8	8	9	5	4	3	7
UE	12	14	10	7	6	5	11
Total	13	10	9	8	6	5	10

There is very little difference in the results for standard and accredited employers.

Table 25: Average claim size by FSC/PDP

Claim Type	ACCPP Plan		Total \$
	PDP \$	FSCP \$	
Medical only	192	205	203
Weekly compensation	7,862	7,052	7,155
Other entitlement	1,937	2,169	2,139
Total	1,597	1,398	1,422

The results show that the PDP accredited employers have higher average claim size than FSC accredited employers. We have not investigated why this might be the case.

Table 26: Average claim size by self-managing vs. TPA employers

Claim Type	Claims management		Total \$
	In-house \$	TPA \$	
Medical only	229	186	201
Weekly compensation	6,544	7,111	6,911
Other entitlement	1,925	2,008	1,978
Total	1,307	1,389	1,360

The results show that the self managed claims have lower average claim size than TPA managed claims. Note that the overall AE average claim size in Table 26 does not agree with the \$1,422 shown in earlier tables due to exclusion of accredited employer claims for which the TPA status (i.e. self-managing or TPA managed) was not known.

Summary of results for average claim size

The multivariate analysis which allows us to compare accredited and standard employer claims on a 'like for like' basis clearly shows the following:

- The longer the claim duration the better the outcome for the accredited employers
- The greater the WSMP of the employer the better the outcome for the accredited employers
- The results of the accredited employers have improved more than the standard employer results since the start of the ACCPP
- The larger employers (whether accredited or standard) achieve better outcomes than smaller employers although for the accredited employers the difference is less.

The results in regard to the effect of the WSMP are considered particularly interesting. If we take it an employer with a WSMP discount of 20% is seriously committed to the rehabilitation of their injured workers, the results suggest that the higher the level of commitment of the employer the better the rehabilitation outcomes (i.e. lower average claim size) are. At the same time if we just compare the results for the standard and accredited employers by WSMP level we get an indicator of the claims management abilities of the TPA's and self managing employers compared to ACC's claims management.

We reaffirm that the results shown in tables 17 to 26 will include the impact of employer size, standard levy band etc and so need to be treated with some caution.

Claim Duration

Here we consider the duration of a claim as defined by the period of time from lodgement to cessation of ACC benefits.

Table 27: Average duration of claims by claim type and cover period

Claim Type	Cover Year						Total
	2000/01	2002/03	2004/05	2006/07	2008/09	2009/10	
Medical only							
SE	4.3	3.9	3.6	3.6	3.2	2.3	3.6
AE	5.3	5.4	5.8	5.0	3.9	2.6	5.1
UE	4.5	4.3	4.0	3.9	3.4	2.5	3.9
Total	4.5	4.2	4.1	3.9	3.4	2.4	3.9
Weekly compensation							
SE	16.4	13.5	11.5	10.0	7.0	3.6	10.9
AE	14.4	12.8	12.1	10.3	7.2	3.7	11.1
UE	15.7	12.7	11.2	9.6	7.1	3.7	10.3
Total	15.8	13.2	11.6	10.0	7.0	3.6	10.8
Other entitlement							
SE	15.4	13.2	10.6	8.5	5.0	2.7	10.0
AE	15.6	14.6	14.7	11.2	6.9	3.5	12.7
UE	47.0	40.9	35.1	20.1	8.6	4.0	28.8
Total	31.8	26.4	23.9	14.7	7.1	3.4	19.8
All claim types							
SE	6.1	5.5	5.0	4.8	3.8	2.5	4.9
AE	6.9	7.1	7.3	6.2	4.7	2.8	6.5
UE	7.9	7.6	6.8	5.5	4.1	2.7	6.1
Total	6.9	6.3	6.0	5.2	4.0	2.6	5.5

For Weekly compensation claims the average duration for a standard employer is 10.9 months compared to 11.1 months for an accredited employer. However for the early cover periods we see better results for the accredited employers. For Medical only claims we see a similar result with the average duration of standard employer claims 3.6 months compared to 5.1 months for an accredited employer. The results for Other entitlement claims for the unallocated employers clearly reflect problems with the data.

Overall the standard employers have a lower duration than the accredited employer claims.

Table 28: Finalised rate by claim type and cover period

Claim Type	Duration (months)						
	0 - 3	3 - 6	6 - 9	9 - 12	12 - 24	24 - 36	36 - 48
Medical only							
SE	62.7%	89.9%	94.1%	96.2%	98.8%	99.4%	99.7%
AE	51.7%	80.0%	88.0%	91.9%	97.0%	98.3%	99.2%
UE	59.3%	87.8%	93.1%	95.5%	98.6%	99.3%	99.6%
Total	60.0%	87.8%	92.9%	95.4%	98.5%	99.2%	99.6%
Weekly compensation							
SE	21.8%	54.1%	67.5%	75.3%	88.9%	93.7%	96.3%
AE	20.5%	48.0%	62.8%	72.6%	89.4%	94.3%	96.8%
UE	22.9%	54.1%	68.0%	76.0%	90.3%	94.8%	96.9%
Total	21.8%	53.0%	66.8%	75.0%	89.3%	94.1%	96.5%
Other entitlement							
SE	36.3%	64.7%	74.5%	80.1%	89.5%	93.2%	95.4%
AE	20.9%	47.3%	60.2%	69.1%	85.9%	92.1%	95.2%
UE	20.0%	36.6%	44.3%	49.1%	59.7%	66.4%	73.5%
Total	25.6%	47.9%	57.1%	62.9%	74.1%	79.7%	84.5%
All claim types							
SE	56.0%	84.0%	89.7%	92.7%	97.1%	98.4%	99.1%
AE	45.1%	73.1%	82.5%	87.6%	95.2%	97.3%	98.6%
UE	53.7%	81.6%	87.8%	90.8%	95.3%	96.7%	97.7%
Total	53.7%	81.6%	88.0%	91.4%	96.2%	97.7%	98.5%

The table above shows the percentage of claims finalised (defined as no longer receiving ACC benefits) by duration.

For weekly compensation claims the results show for claims of duration of 12 or more months the accredited employers have slightly better return to work results however overall standard employers have better outcomes.

Multivariate analysis

As for the average claim size analysis we looked solely at the Weekly compensation claims. We first built a model which considered duration by claim size and then revised the model to be independent of claim size.

The purpose of the investigation was to analyse differences between the standard employers and accredited employer claim durations (i.e. length of time from notification to finalisation, denominated by the date of the last payment made in respect of a claim). The most obvious feature of this data is that in the later cover years there is less time to finalise. Thus working with only finalised claims introduces a large bias into the results.

In order to circumvent this problem we have used survival regression techniques which take into account information from both finalised and active claims. Here we assume the claim duration follows a Weibull distribution which is a common distribution in modelling “time to failures” in actuarial sciences. This regression analysis uses a log link function and as a result the results are now set out on a multiplicative basis.

The key drivers for claim size were:

- Employer type (AE vs. SE)
- Cover year
- Claim size group
 - Small (\leq \$2,000)
 - Medium
 - Large (\geq \$11,000)
- Injury Diagnostic Category
- Standard levy band (SLB)
- Large employer status
- Liable earnings per SLB

For each factor above, the model indicated very strong evidence against the hypothesis that their effect was due to random variation. Other factors such as the effect of third party administrators and the liable earnings (per SLB) were also proved to be statistically significant however these (smaller) effects were not considered material and were removed for simplicity.

Quantifying the above effects is tricky due to the large number of ‘interactions’ present in the data. Here interaction is taken to mean the effect on claim duration of one factor (e.g. SLB) is dependent on the level of another factor (e.g. whether the employer is an AE or SE). It should also be noted that there were a large number of additional interaction effects present in the data which were chosen to be ignored due to the non trivial added complication which they produce.

Quantifying the Model results

The following table sets out the relative effects of changing various risk factors for a small accepted amputation claim from a not large accredited employer in SLB 0 with \$1 liable earnings in 2001. Again it should be noted that while the above claim type is impossible in practice it is for comparison purposes only.

Table 29: Relativity factors for claim duration

Employer Type		Large Employer Status = Yes	
Accredited	100%	Accredited	100%
Standard	44%	Standard	105%
IDC		Claim Size	
Amputation	100%	<i>Accredited Employer</i>	
Burns	72%	Small	100%
Concussion	102%	Medium	128%
Dental Injuries	150%	Large	251%
Foreign Body In Orifice/eye	103%	<i>Standard Employer</i>	
Fracture/dislocation	80%	Small	100%
Gradual process	86%	Medium	137%
Hernia	80%	Large	287%
l/non-i Laceration,puncture,sting	63%		
Inhalation/ingestion Specific Occ.	129%	Log Liable Earnings	
n.a	79%	Accredited	-3%
Occp.dis (ab/lead,bru,derm,hep,lep	110%	Standard	0%
Other	79%		
Soft Tissue Inj (contu,str,spr,int	74%	Standard Levy Band Inflation	
		Accredited	-3.2%
Inflation Rate (p.a.)		Standard	-1.8%
Accredited	-7%		
Standard	-11%		
Acceptance Status:			
Accepted	100%		
Declined	123%		

How to use the relativity factors

The method given in the fully worked example of how to use Table 16 in Appendix 6 may be similarly applied to Table 29 above. Some simple examples are given below:

Cover Year:

The model indicates that, holding all else constant, the average claim duration decreases by:

- 7% per annum for AEs.
- 11% per annum for SEs.

Injury Diagnosis Category:

The model indicates that, holding all else constant, the claim duration for

- Burn claims are 28% shorter than amputation claims.
- Dental injury claims are 50% longer than amputation claims.

Claim Size:

The model indicates that, holding all else constant, as the size of the claim increases so too does the duration – this effect is estimated to be greater for SEs than AEs. Where a small claim is less than \$2,000 and a large claim is greater than \$11,000.

Standard Levy Band:

The model indicates that, holding all else constant, the claim duration decreases by SLB, this effect is more extreme for SEs than AEs and varies depending on the size of employer.

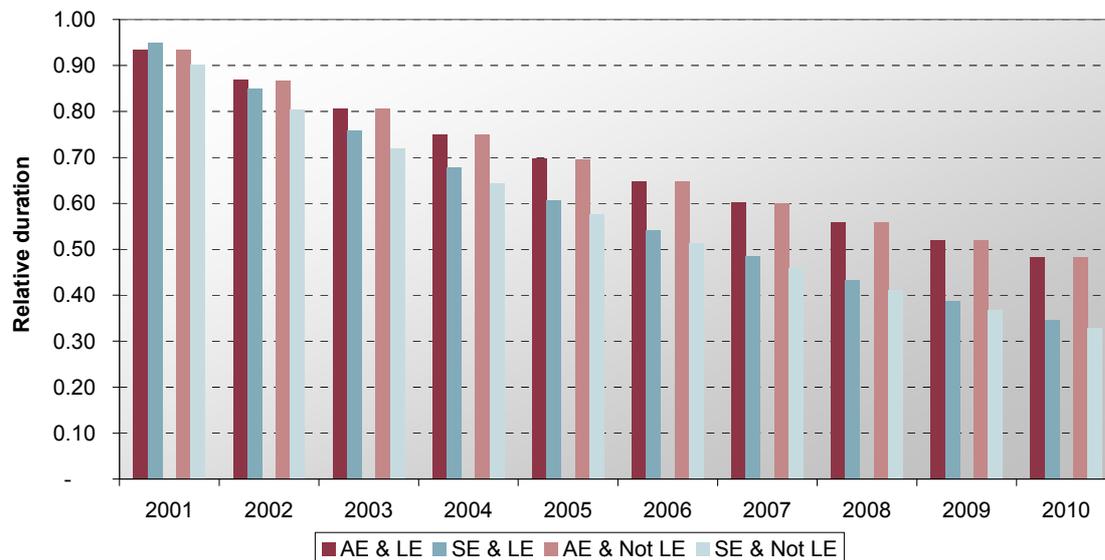
Illustrating the Model Results

In the charts below we have compared the median claim duration for different employer types with liable earnings of \$40m in SLB 10 looking at first small size claims, then medium size claims and finally large size claims (as defined earlier). Note that the scale is set just for comparative purposes.

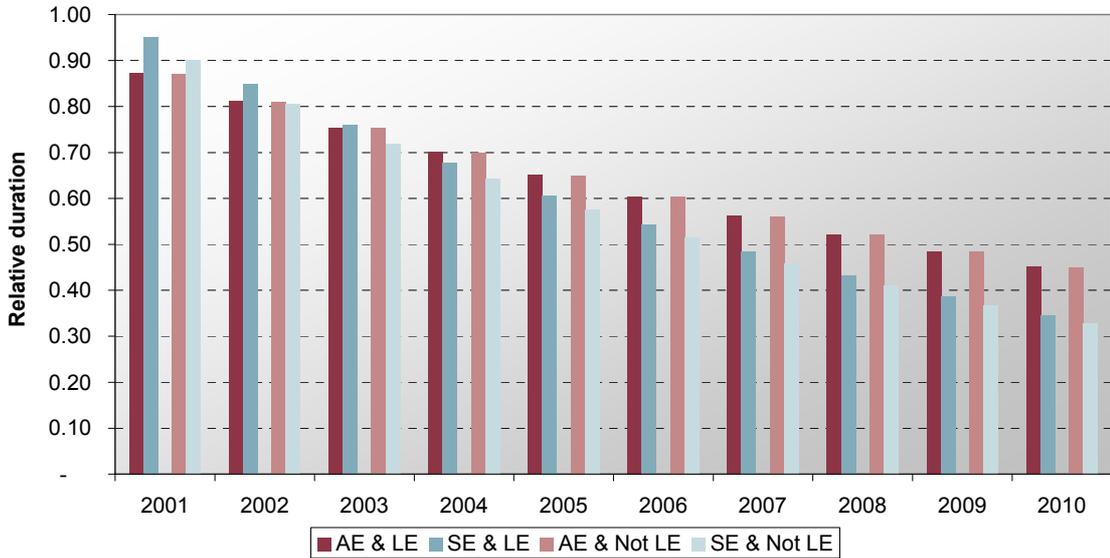
Note here “Large” refers to an employer who is in the top 10% of liable earnings with multiple classification units. Also the results for the small, medium and large claim size cannot be directly compared to each other.

Figure 5: Modelled results: Median claim duration

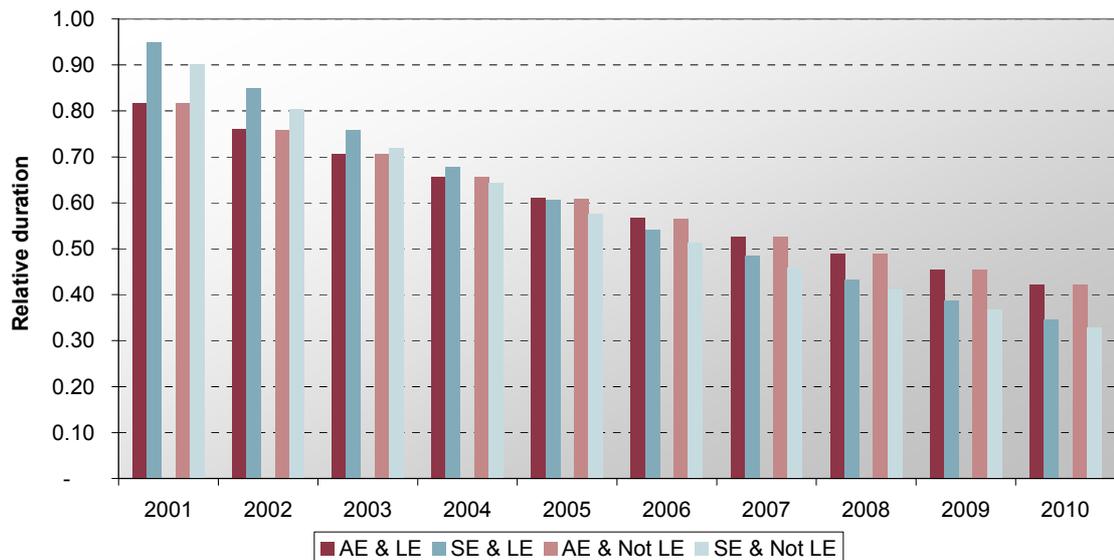
Small claim size



Medium claim size



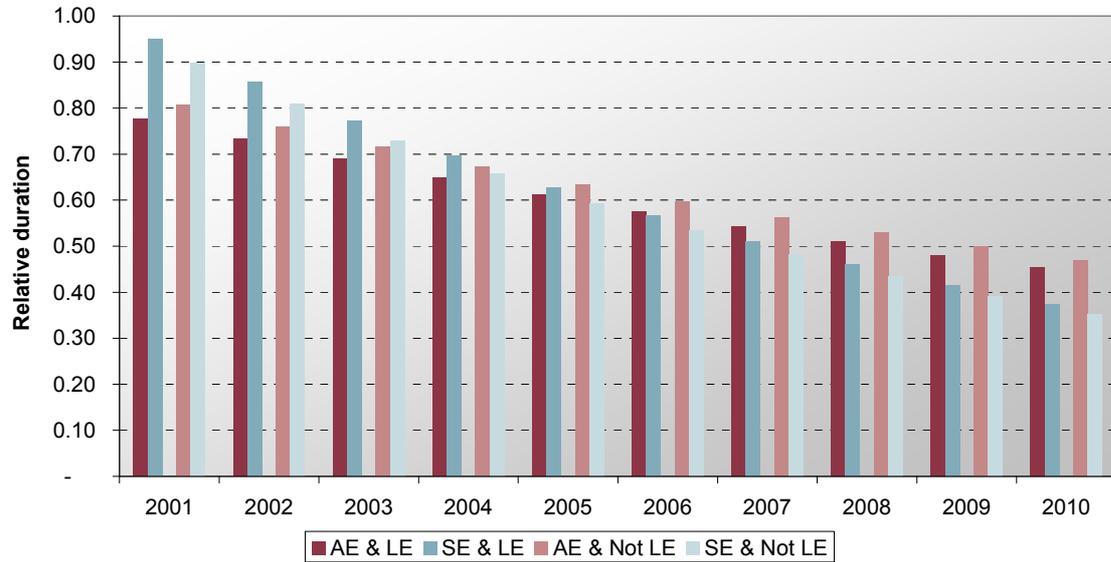
Large claim size



All three charts show similar results with the duration of the standard employers improving more over the period than the accredited employers and, for the most recent cover year, the average duration of standard employers is less than for accredited employers in all cases.

The results are summarised in the chart below where the relative median duration independent of claim size is shown.

Figure 6: Modelled results: Median claim duration independent of claim size



Claim rates

The table below shows the claim rate per \$1 million liable earnings split by claim type and cover period. This is before any allowance for the different risk profiles of the industries that the employers are engaged in.

Table 30: Claim rates by claim type and cover period

Claim Type	Cover Year						Total
	2001	2003	2005	2007	2009	2010	
Medical only							
AE	1.99	1.84	1.69	1.50	1.24	0.65	1.44
SE	2.66	2.27	1.78	1.46	1.27	0.98	1.60
Total	2.47	2.17	1.76	1.47	1.26	0.91	1.56
Weekly Compensation							
AE	0.31	0.35	0.35	0.32	0.29	0.13	0.29
SE	0.40	0.37	0.33	0.29	0.23	0.13	0.28
Total	0.38	0.36	0.33	0.30	0.24	0.13	0.28
Other Entitlement							
AE	0.11	0.13	0.11	0.09	0.08	0.04	0.09
SE	0.09	0.08	0.06	0.06	0.05	0.03	0.06
Total	0.09	0.09	0.07	0.07	0.05	0.03	0.06
All Claims							
AE	2.41	2.32	2.15	1.91	1.60	0.81	1.82
SE	3.15	2.72	2.17	1.81	1.54	1.14	1.93
Total	2.94	2.62	2.16	1.83	1.55	1.07	1.91

If the standard employers were engaged in the same industries as the accredited employers, we would expect the claim rate for standard employers would increase to 2.07 per \$1 million liable earnings. That is, after allowing for the fact that standard and accredited employers are engaged in different industries, the standard employers' claim rate is 14% higher than the accredited employers' claim rate. Details on this are shown at the end of this sub-section.

Multivariate analysis

We again used multivariate analysis to determine the key factors which determine the claims incidence and again just considered weekly compensation claims.

As the number of claims is not a normally distributed variable this process was modelled using a generalised linear model with a negative binomial response.

The Poisson distribution is the natural distribution for modelling this type of data but due to clear evidence of over dispersion this was unacceptable. The negative binomial distribution is equivalent to using a Poisson distribution where the parameter (λ) follows a gamma distribution.

This model uses a log link function and as a result the results are now set out on a multiplicative basis.

The key drivers for claim rates were:

- Employer type (AE vs. SE)
- Cover year
- Standard levy band (SLB)
- Discount Group
- Total Liable Earnings.

These factors allow us to explain roughly 96% of the variation in claim notifications; hence the model should be good for prediction as well as for illustrating the trends and the direction of effects.

The model provides very strong evidence of:

- an increasing trend in claim notifications with SLB – holding all else constant; and very strong evidence that this effect is more severe for SEs than AEs.
- a decreasing trend in claim notifications with cover year for the SEs only.
- as the liable earnings for an employer increase the number of claims per \$1m liable earnings decreases. The direct relationship between liable earnings and claims rates complicated and does not affect the relativities between accredited and standard employers and so has been omitted for simplicity.

There is also strong evidence that holding all else constant claim notifications decrease as the discount amount increases.

Quantifying the Model Results

The following table sets out the relative effects of changing various risk factors from an accredited employer claim rate in 2000 with a 0% discount, in SLB 0 and \$1 million liable earnings. Again, it should be noted that the above claim type is impossible in practice – it is for comparison purposes only.

Table 31: Relativity factors for claim incidence

Employer Type		Discount Group	
Accredited	100%	<i>Accredited Employer</i>	
Standard	176%	0%	100%
		10%	116%
Inflation Rate (p.a.)		15%	125%
Accredited	0%	20%	135%
Standard	-6%	<i>Standard Employer</i>	
Standard Levy Band Inflation		0%	100%
Accredited	23%	10%	84%
Standard	26%	15%	77%
		20%	70%

How to use the relativity factors

The method given in the fully worked example of how to use Table 16 in Appendix 6 may be similarly applied to Table 31 above. Some simple examples are given below:

Cover Year:

The model indicates that, holding all else constant, the claim rate decreases by 6% per annum for SEs but remains constant for AEs.

Discount Group:

The model indicates that, holding all else constant, the claim rate increases with WSMP discount for accredited employers but decreases with WSMP discount group for standard employers.

Standard levy band:

The model indicates that, holding all else constant, the claim rate on average increases by:

- 23% for each increase in SLB for accredited employers.
- 26% for each increase in SLB for standard employers.

Illustrating the Model Results

The following figures illustrate the effect of changing the cover year, employer type, SLB and WSMP discount for employers with liable earnings of \$40m.

Figure 7: Modelled results: Claim rates for SLB1 for employers with 10% WSMP

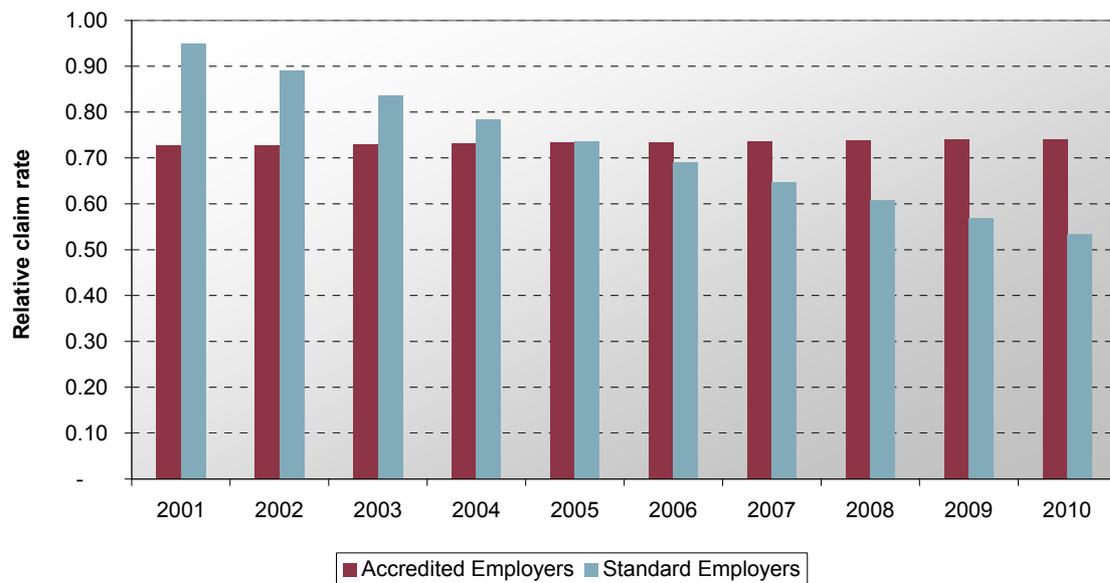


Figure 8: Modelled results: Claim rates for SLB1 for employers with 20% WSMP

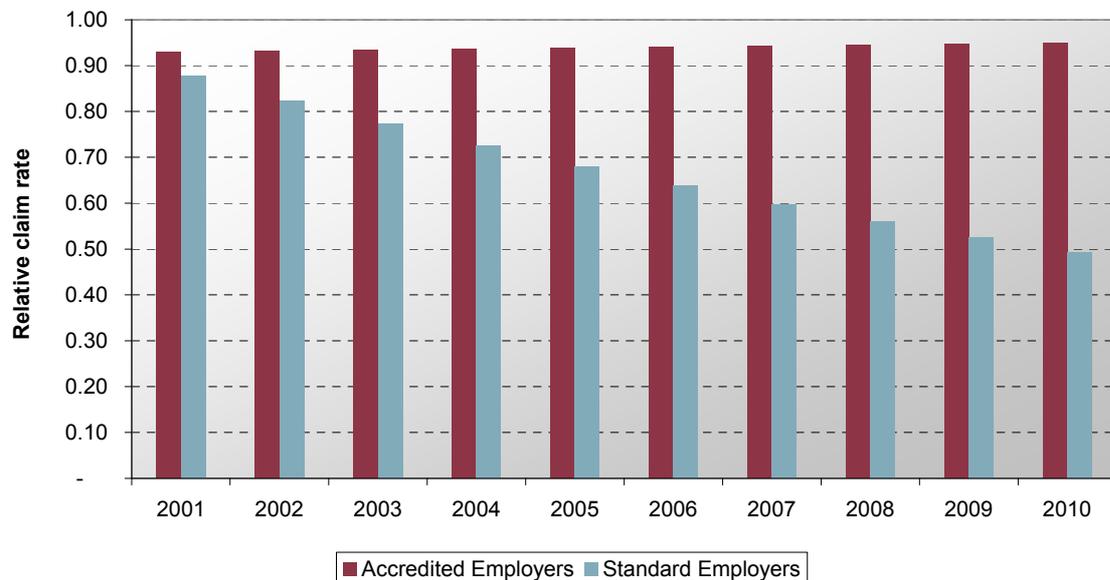


Figure 9: Modelled results: Claim rates for SLB18 for employers with 10% WSMP

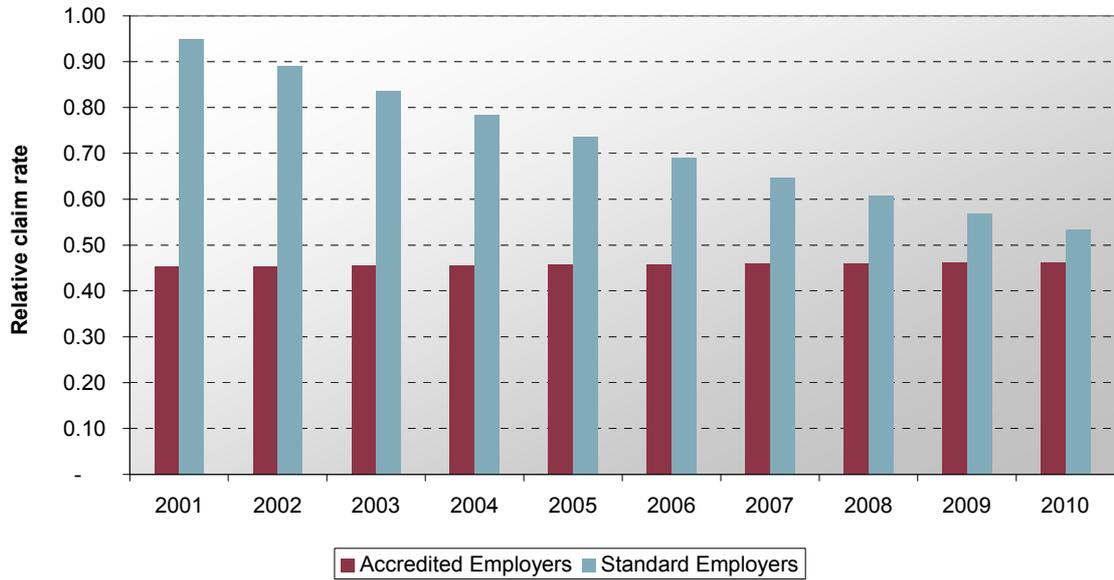
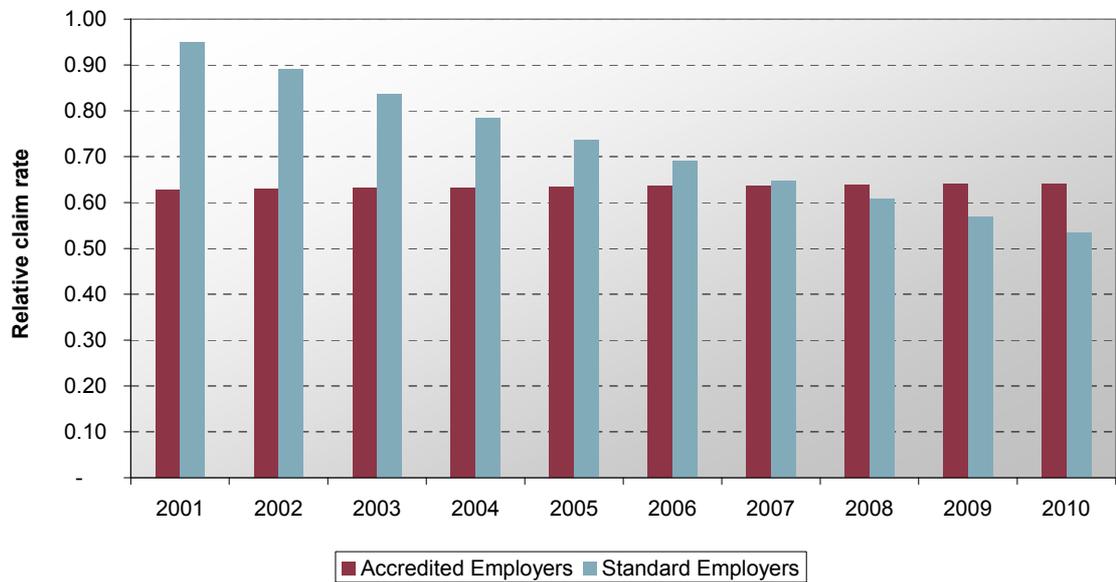


Figure 10: Modelled results: Claim rates for SLB18 for employers with 20% WSMP



Summary

The model indicates claim rates for standard employers were much higher than accredited employers in the earlier period of observation. However there is evidence to suggest for a strong decreasing trend for standard employers' claim rates through time.

Further results

Here we include further results from our 2 and 3-way analyses. We again emphasise the importance of the results of the multivariate analysis over those presented here, which are shown for interest only. In some cases there may be factors interacting that drive the observed 2 and 3-way results and because of this, some of these results support the corresponding multivariate analysis, while others do not.

The following tables show the claims rates by individual SLB.

Table 32: Claim rates by SLB

SLB	SE	AE	Total	AE / SE
1	0.20	0.10	0.19	49%
2	0.35	0.32	0.34	92%
3	0.35	0.43	0.37	122%
4	0.67	0.67	0.67	100%
5	0.23	0.48	0.26	205%
6	0.67	0.27	0.65	40%
7	0.75	1.06	0.78	140%
8	1.25	1.47	1.29	117%
9	1.50	0.84	1.39	56%
10	1.52	2.09	1.80	138%
11	1.66	0.76	0.95	45%
12	2.52	2.78	2.54	111%
13	3.20	2.56	3.02	80%
14	3.22	2.20	2.89	68%
15	3.25	2.81	3.14	86%
16	3.88	2.56	3.67	66%
17	4.29	3.19	4.11	74%
18	5.11	6.15	5.35	120%
19	23.64	27.28	25.17	115%
Total	1.93	1.82	1.91	94%

The table illustrates how the claim rates as expected increase by SLB. The table below illustrates the SLB rate by cover year.

Table 33: Claim rate by SLB grouping and cover year

SLB	Cover Year						Total
	2000/01	2002/03	2004/05	2006/07	2008/09	2009/10	
1 - 6							
SE	0.46	0.46	0.38	0.29	0.35	0.23	0.35
AE	0.88	0.57	0.39	0.29	0.34	0.23	0.42
7 - 12							
SE	1.93	2.17	1.72	1.48	1.09	0.99	1.53
AE	1.48	1.83	1.51	1.38	1.23	0.69	1.38
13 - 19							
SE	4.73	5.49	4.37	3.65	3.03	2.23	3.88
AE	2.50	4.03	4.18	3.94	2.95	1.46	3.28
Total	2.20	2.62	2.16	1.83	1.55	1.07	1.91

The results show the claim rate has been reducing over the period for both standard and accredited employers. The multivariate analysis identified that the fall in the claims rate for standard employers is the most pronounced.

The table below shows the claims rates by SLB groupings and liable earnings groupings.

Table 34: Claim rates by liable earnings and SLB

SLB	Liable earnings (\$m)				Total
	< 1	1 - 10	10 - 100	> 100	
1 - 6					
SE	0.54	0.41	0.39	0.11	0.35
AE	0.15	0.13	0.43	0.44	0.42
7 - 12					
SE	1.66	1.50	1.44	0.50	1.53
AE	5.04	0.68	1.07	1.59	1.38
13 - 19					
SE	3.96	3.94	3.28	1.05	3.88
AE	7.46	2.74	2.83	3.88	3.28
Total	2.41	2.17	1.50	1.17	1.91

The results show that the higher the liable earnings the lower the claim rate and the higher the SLB group the higher the claims rate. In general the accredited employers are less than the standard employers however there are exceptions to this such as, for the highest liable earning group, the standard employers' rates are less than the accredited employer rates.

The table below shows the claim rates by WSMP discount rate and liable earnings.

Table 35: Claim rates by H&S discount and liable earnings

H&S discount	Liable earnings (\$m)				Total
	< 1	1 - 10	10 - 100	> 100	
0%					
SE	2.38	2.01	1.04	0.07	1.88
AE	0.00	0.00	0.00	0.00	0.00
Total	2.38	2.01	1.04	0.07	1.88
10%					
SE	3.30	3.16	1.86	0.79	2.53
AE	3.04	2.24	1.61	1.33	1.51
Total	3.25	2.72	1.66	1.32	1.70
15%					
SE	2.89	2.98	1.68	0.76	2.15
AE	15.83	0.85	2.17	3.28	2.59
Total	4.08	2.66	1.91	2.41	2.33
20%					
SE	2.34	2.46	1.60	0.15	1.98
AE	0.65	1.04	1.55	3.25	2.41
Total	2.20	2.31	1.59	3.12	2.14
Total	2.41	2.17	1.50	1.17	1.91

The claims rate do not reduce the higher the WSMP discount indicating that there are other factors not being picked up in the table. The tables below look further at the claims rates for accredited employers.

Table 36: Claim rates by FSC and PDP

	Partnership Plan		Total
	PDP	FSCP	
Rate per \$1m LE	1.46	1.89	1.82

The variance between the PDP and FSC employers is striking indicating that the FSC employers are in the more risky industries.

The table below shows the claim rates for self managed compared to TPA accredited employer managed claims. This shows that the self managed are in the more risky industries.

Table 37: Comparison of claim rates, self- vs TPA-managed claims

	Administration		Total
	Self	TPA	
Rate per \$1m LE	2.83	1.52	1.82

The table below looks at the different risk profile of the employers.

Table 38: Impact of the different risk profiles of Accredited and standard employers

SLB	Claim rate per \$1m liable earnings				Number of Accredited Employer claims		
	SE	AE	Total	AE / SE	Expected*	Actual	E / A
1	0.20	0.10	0.19	49%	249	122	204%
2	0.35	0.32	0.34	92%	3,504	3,231	108%
3	0.35	0.43	0.37	122%	3,234	3,950	82%
4	0.67	0.67	0.67	100%	3,302	3,295	100%
5	0.23	0.48	0.26	205%	1,354	2,782	49%
6	0.67	0.27	0.65	40%	777	308	252%
7	0.75	1.06	0.78	140%	3,196	4,476	71%
8	1.25	1.47	1.29	117%	6,613	7,737	85%
9	1.50	0.84	1.39	56%	8,880	4,935	180%
10	1.52	2.09	1.80	138%	23,451	32,255	73%
11	1.66	0.76	0.95	45%	32,958	14,994	220%
12	2.52	2.78	2.54	111%	10,367	11,460	90%
13	3.20	2.56	3.02	80%	26,070	20,838	125%
14	3.22	2.20	2.89	68%	41,116	28,142	146%
15	3.25	2.81	3.14	86%	26,148	22,608	116%
16	3.88	2.56	3.67	66%	19,761	13,063	151%
17	4.29	3.19	4.11	74%	21,369	15,881	135%
18	5.11	6.15	5.35	120%	41,842	50,351	83%
19	23.64	27.28	25.17	115%	4,180	4,823	87%
Total	1.93	1.82	1.91	94%	278,369	245,251	114%

* Expected number of Accredited Employer claims applying the Standard Employer claim rates

The table above shows the claim rates by SLB and the expected accidents applying the standard employer injury rates to the accredited employers' liable earnings by SLB. On average the accredited employers are in industries with higher risks.

Other results

In this section we look at a number of miscellaneous results.

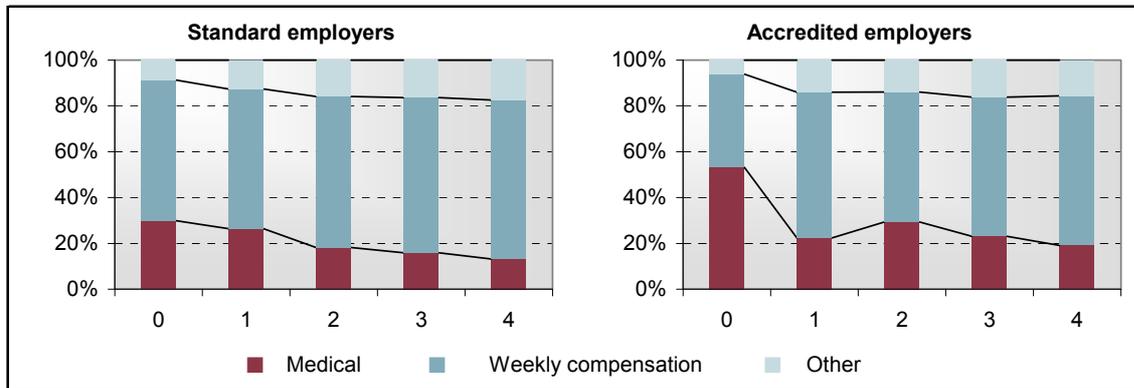
Table 39: Claim development patterns

Cover Period	Standard employers Development Year						Accredited employers Development Year					
	0	1	2	3	4	Total	0	1	2	3	4	Total
2001	26%	56%	68%	77%	82%	82%	23%	58%	69%	76%	83%	83%
2002	33%	61%	73%	81%	86%	86%	27%	54%	64%	72%	81%	81%
2003	33%	62%	74%	82%	88%	88%	31%	58%	72%	81%	87%	87%
2004	36%	66%	78%	86%	92%	92%	31%	63%	76%	85%	92%	92%
2005	36%	67%	81%	89%	96%	96%	101%	71%	82%	89%	95%	95%
2006	38%	72%	86%	95%	100%	100%	37%	74%	87%	95%	100%	100%
2007	40%	77%	93%	100%		100%	37%	77%	93%	100%		100%
2008	45%	87%	100%			100%	39%	85%	100%			100%
2009	60%	100%				100%	54%	100%				100%
2010	100%					100%	100%					100%

The table above shows the claims development pattern over the first 5 years for standard and accredited employers. For example, for standard employers, 92% of the total paid to date for the 2004 cover year was paid in the first 5 years.

The following chart looks at the distribution of the payments over the first 5 development years.

Figure 11: Claim development by payment type



The charts show that, over time, the percentage spent on weekly compensation increases, with the accredited employers paying proportionally less on weekly compensation.

The table below shows the percentage of claims for which there was a break in payments for two successive quarters with payments continuing after the break.

Table 40: Reopen rates

	Cover Year						Total
	2000/01	2002/03	2004/05	2006/07	2008/09	2009/10	
SE	6.7%	6.3%	5.7%	5.4%	3.0%	1.4%	5.0%
AE	6.2%	6.1%	7.3%	7.0%	4.4%	1.6%	6.1%
Total	6.6%	6.2%	6.0%	5.7%	3.2%	1.5%	5.2%

The table shows that overall the accredited employers have a higher rate of a claim reopening than standard employers.

The table below shows a breakdown of the claims acceptance rate by claims type and cover year. As noted previously there are some data classification issues with the accredited employer claims.

Table 41: Breakdown of acceptance rates by claim type and cover year

Claim Type	Cover Year						Total
	2000/01	2002/03	2004/05	2006/07	2008/09	2009/10	
Medical only							
SE	94%	93%	93%	94%	94%	94%	94%
AE	66%	57%	58%	55%	56%	49%	57%
UE	83%	84%	84%	85%	81%	80%	84%
	84%	82%	82%	82%	82%	81%	82%
Weekly compensation							
SE	99%	99%	100%	100%	100%	100%	100%
AE	95%	93%	95%	96%	98%	98%	95%
UE	97%	97%	98%	98%	99%	100%	98%
	98%	98%	98%	99%	99%	99%	98%
Other entitlement							
SE	96%	92%	86%	73%	91%	96%	86%
AE	82%	74%	67%	64%	69%	71%	70%
UE	95%	94%	92%	85%	92%	93%	91%
	93%	89%	85%	77%	88%	90%	85%
All claims	85%	84%	84%	84%	84%	83%	84%

The results above suggest there are some status classification issues to address for accredited employers.

Possible future analysis

The following analysis was not possible given the time limits on the project:

- Multivariate analysis on claim size, duration and claims rates for Medical only and Other entitlement claims.
- Similarly the restriction in the data set released prevented analysis of the data by industry type. Of particular interest would have been a comparison of the experience of all the employers with liable earnings greater than \$10 million. To illustrate for employers with liable earnings between \$50 million and \$100 million there is roughly a 50:50 split between standard and accredited employers.
- Exploring the reasons for
 - The substantial decrease in the weekly compensation incidence rate for standard employers
 - The significant variation in the cost of the claims of duration 36 – 48 months between standard and accredited employers
 - The high decline rate for the medical only accredited employer
 - The declined claims with payments made on them
 - The accepted claims with no payments
 - The reasons where the one way analysis produces results at variance to the multivariate analysis.
- The average claim size for other specific injury types
- The impact of the different claims management costs for TPA's compared to ACC costs
- Looking more closely at the performance of the PDP employers particularly after the claims are handed back to ACC.
- The relative performance of the different TPA's.

Appendix 4: Data received

The following description of data received is in respect of the final extracts.

All extracts were provided via email in the form of zipped .tab text files by ACC's Product, Pricing and Distribution division.

A breakdown of the fields provided for each data table is given below.

Claims

The claims file contained 2,314,897 records – one for each claim.

Field Name	Description	Comments
Event_encrypt	Claim number	Unique for each record.
PersonID_encrypt	Claimant identifier	Not exactly unique for each claimant – found cases where two claim numbers were meant to relate to the same claim however the [PersonID_encrypt] fields were different. This was not investigated further as this field was not used and it is possibly just a result of the encryption.
Employer_encrypt	Employer identifier	Unique for each employer but grouped for about 1/3 of claims.
Sex	Claimant sex	M or F
lodgdate	Quarter and year of lodgment date	Ranged from 2000/3 (i.e. September quarter, year 2000) to 2010/1.
Accidate	Quarter and year of the injury date	Ranged from 2000/3 to 2010/1.
AgeAtRegistration	Claimant age at the date of lodgment	Some anomalies e.g. null (3 claims), negative (172 claims), zero (491 claims). Field not used.
Outcome	Current status of claim	<ul style="list-style-type: none"> • Closed Cases - 2,243,133 claims • Open Cases – 69,919 claims • Re-Open Cases – 1,750 claims • Undefined – 95 claims
Cause	Cause of injury	42 different causes – 313,608 claims with “Other or Unclear Cause”.

Field Name	Description	Comments
Decision	Whether a claim was accepted / declined or otherwise	<ul style="list-style-type: none"> • Accept - 1,942,499 claims • Decline – 283,260 claims • Accredited employer - 61,454 claims • Duplicate - 21,788 claims • Held - 5,846 claims • Interim Accept – 10 claims • Migrated Data – 40 claims
InjsInjSite	Site of injury	30 different injury sites – 112,801 claims with “Unobtainable” and null for 71,272 claims.
InjsDiagnosis	Description of ACC Injury Diagnosis READ Code.	33 different injury diagnoses – null for 71,272 claims, 82,878 claims with “Other”.
CT* (received this field in an earlier dataset)	ACC definition of claim type	<ul style="list-style-type: none"> • Medical only - 2,037,858 claims • Other Entitlement - 54,022 claims • Weekly Compensation - 223,017 claims

Claims lodged by AE and ACC – claim number mapping

This file contained 12,410 records – one for each ACC issued claim number – relating to 11,911 unique claim events. I.e. as well as being lodged with both an accredited employer and directly with ACC, some claims were assigned more than one ACC issued claim number. This table enabled us to link duplicated claim records and pick up all payment records for related claims. Without this link some payments made on claims that were not accepted would be omitted from the analysis as was the case for earlier versions of this report.

Our approach to handling claims lodged both by an AE and ACC was to include the payments for all related claims, whether individually accepted or not, provided at least one of the related claims was accepted. The claim details were then grouped such that all related claims were counted as a single claim. A consequence of this was the inclusion of payments on claims that previously looked like they were not accepted and a decrease in the total number of claims, meaning an increase in the average claim size compared to not linking related claims.

In grouping the related claim records a number of judgement calls had to be made to manage various inconsistencies in both the claims data and the employer data. For example two related claims might show different injury types or different ACCPP cover.

The table below shows how the final dataset was reached for the 11,911 unique claims – for each field used in our analyses in which inconsistencies occurred the rule as to how the inconsistencies were treated is given.

Field Name	Description	Treatment of inconsistencies
InjsDiagnosis	Injury description	First recorded
InjsInjSite	Injury site	First recorded
lodgdate	Quarter claim reported	Take minimum
Decision	Acceptance status	Claim classified as accepted if at least one related claim accepted
Plan	ACCPP plan i.e. PDP or FSC	If one related claim PDP then PDP otherwise FSC
SLB	Standard levy band	Take maximum
Discount	WSMP discount	Take maximum
TPA level	Self managing vs. TPA managed	If one related claim self managing then self managed otherwise TPA managed
Large Employer?	Large employer indicator	If one related claim true then true otherwise false

Once the data was grouped various fields were recalculated for the 11,911 unique claims as per the table below:

Field Name	Description	Calculated as
Claim type	I.e. WC, Medical only, OE	If at least one WC payment made on all related claims then WC otherwise if at least one OE payment made on all related claims then OE otherwise Medical only.
Paid to date		Sum of all related claim payments.
Duration		Difference between the maximum payment date on all related claims and the minimum lodgement date on all related claims.

Payments

The claims file contained 3,880,355 records – one for each payment type per payment quarter.

Field Name	Description	Comments
Event_encrypt	Claim number	1,853,716 unique claim numbers.
PaymentQuarter	Quarter and year of payment date	Ranged from 2000/1 (i.e. March quarter, year 2000) to 2010/1.
PaymentType	Type of payment made	<ul style="list-style-type: none"> • Weekly Compensation - \$1,444m paid • Medical treatment - \$532m paid • Elective surgery - \$223 paid • Social rehab - \$174m paid • Vocational rehab - \$105m paid • IA, lump sums & other rehab - \$81m paid • Death grants & compensation - \$40m paid
TotalAmountNet	Amount paid net of GST.	Some anomalies e.g. very large (\$26m) payments which are subsequently reversed.

Claim – employer ID mapping

This file contained 1,804,599 records – one for each claim for which an employer ID was available. This table was the link between the claims table (above) and the employer data.

Field Name	Description	Comments
Event_encrypt	Claim number	Unique for each record.
Employer_encrypt	Employer CU identifier	Unique for each employer / CU combination.

Exposure

This file contains the liable earnings data for each Employer CU as at each 1 April. The Employer identifier provided was a combination of employer and each classification unit for that employer. The total employer identifier can be isolated by taking the last 16 digits of the [employer_encrypt] field.

Field Name	Description	Comments
employer_encrypt	Employer CU identifier	Unique for each employer / CU combination.
Levyyear	1 April – 31 March	Ranged from 2002 – 2010. The 2001 cover period was not included as it was not a full year. We decided to repeat the 2002 records for 2001 with liable earnings adjusted to 75% of the 2002 level.
liableearnings	Liable earnings for each CU of each employer	Some anomalies e.g. negative liable earnings, zero liable earnings.
SLB	Standard levy band code.	SLB1 – SLB19.
LargeEmployer	Large Employer Indicator	Indicates employer is in top 10% of total liable earnings and is spread across multiple CUs. Calculated by ACC.

Cover

Field Name	Description	Comments
employer_encrypt	Employer CU identifier	Unique for each employer / CU combination.
Year	Cover year	Ranged from 1975 – 2035. Some anomalies – found one cover year missing for some employers (usually the first) but those employers did have liable earnings data for that year. Chose to repeat the subsequent cover year's records for the "missing" year if there were liable earnings for that year.
product_code	ACC cover	WPC, Full Self-cover or Partnership discount.
incentive_result _type_code	H&S discount – WSD or WSMP	<ul style="list-style-type: none"> • None • WSD • WSMP Primary • WSMP Secondary • WSMP Tertiary
TPA_service_level	Code relating to level of TPA involvement.	<ul style="list-style-type: none"> • Null • A • B • C • D • SM <p>Our analysis distinguished only between those employers who self-manage and those who use a TPA for claims management.</p>
SLB	Standard levy band code.	SLB1 – SLB19.
PPGroup	Unique combination of Product, incentive and TPA service level (SM or TPA).	PP1 – PP12
LargeEmployer	Large Employer Indicator	Indicates employer is in top 10% of total liable earnings and is spread across multiple CUs. Calculated by ACC.

Appendix 5: Mappings for grouped injury diagnosis and site

Injury diagnosis

Table 42: Grouped injury diagnosis categories

Injury Diagnosis	Grouped Injury Diagnosis Category
	n.a
Additional Minor Injuries	Other
Amputation	Amputation
Amputation/enucleatn	Amputation
Burn	Burns
Burns (burn,scald,corrosive Inj'y)	Burns
Concussion	Concussion
Contusion(intact Skin)inc Crushing	Soft Tissue Inj (contu,str,spr,int
Corrosive Injuries	Other
Dental Injuries	Dental Injuries
Dental Injury	Dental Injuries
Foreign Body In Orifice/eye	Foreign Body In Orifice/eye
Fracture	Fracture/dislocation
Fracture/dislocation	Fracture/dislocation
Gradual Process - Compress Synd.	Gradual process
Gradual Process - Local Inflam.	Gradual process
Hernia	Hernia
I/non-i Laceration,puncture,sting	I/non-i Laceration,puncture,sting
Industrial Deafness	Gradual process
Inhalation/ingestion Specific Occ.	Inhalation/ingestion Specific Occ.
Laceration - Not Infected	I/non-i Laceration,puncture,sting
Mental/nervous Shock	Other
Non-occupational Disease/infection	Other
Occp.dis (ab/lead,bru,derm,hep,lep	Occp.dis (ab/lead,bru,derm,hep,lep
Occupational Asthma	Other
Other	Other
Pain Syndromes	Other
Puncture Wound	Soft Tissue Inj (contu,str,spr,int
Self Administered Drugs/treatment	Other
Soft Tissue Inj (contu,str,spr,int	Soft Tissue Inj (contu,str,spr,int
Sprain Or Strain	Soft Tissue Inj (contu,str,spr,int
Trauma Induced Hearing Loss	Gradual process
w5	Other

Injury site

Table 43: Grouped injury site categories

Injury Site	Grouped Injury Site Category
Abdomen/pelvis	Body
Back Except Head Vertebrae	Body
Chest	Body
Lower Back/spine	Body
Upper Back/spine	Body
Ear	Head
Eye	Head
Nose	Head
Neck, Back Of Head Vertebrae	Head
Face	Head
Head (except Face)	Head
Internal Organ	Internal
Heart	Internal
Other Internal Organ	Internal
Lung	Internal
Kidney	Internal
Upper And Lower Arm	Limb
Ankle	Limb
Toes	Limb
Shoulder (incl Clavicle/blade)	Limb
Elbow	Limb
Hip, Upper Leg, Thigh	Limb
Finger/thumb	Limb
Foot	Limb
Hand/wrist	Limb
Lower Leg	Limb
Knee	Limb
Multiple Locations	Multiple locations
.	n.a
Unobtainable	n.a

Appendix 6: Worked example to illustrate use of the relativity factors

This appendix gives a fully worked example of how to apply the relativity factors for the average claim size model given in Table 16 (repeated below for ease of reference). Table 16 compares the relative effects of changing various risk factors to a standardised baseline claim type.

Table 16: Relativity Factors for the average claim size model

Employer Type		Large Employer Status = Yes	
Accredited	100%	Accredited	92%
Standard	981%	Standard	88%
IDC		Claim Duration	
Amputation	100%	<i>Accredited Employer</i>	
Burns	43%	Short	100%
Concussion	119%	Medium	231%
Dental Injuries	67%	Long	817%
Foreign Body In Orifice/eye	34%	<i>Standard Employer</i>	
Fracture/dislocation	124%	Short	100%
Gradual process	176%	Medium	279%
Hernia	117%	Long	1572%
l/non-i Laceration,puncture,sting	55%	Discount Group	
Inhalation/ingestion Specific Occ.	101%	<i>Accredited Employer</i>	
n.a	81%	0%	100%
Occp.dis (ab/lead,bru,derm,hep,lep	61%	10%	66%
Other	151%	15%	53%
Soft Tissue Inj (contu,str,spr,int	136%	20%	43%
Acceptance Status		<i>Standard Employer</i>	
Accepted	100%	0%	100%
Decline	97%	10%	91%
Inflation Rate (p.a.)		15%	87%
Accredited	3%	20%	83%
Standard	4%		
Standard Levy Band Inflation		Log Liable Earnings	
Accredited	3.4%	Accredited	9%
Standard	2.7%	Standard	-6%

The baseline claim type has the following characteristics.

Acceptance Status:	Accepted
Claim Duration:	Short
Claim Type:	Accredited
Discount Group:	0%
Injury Diagnostic Category:	Amputation
Large Employer:	No
Liable Earnings:	\$1
SLB:	0
Year :	2001

Assuming, for example, the baseline average claim size is \$100 we can use Table 16 to estimate the average claim size of a more realistic claim type. For example:

- changing the WSMP discount to 15%:
 - $\$100 \times 53\% = \53
- then changing the liable earning from \$1 to \$20,000,000:
 - $\$53 \times (1 + 9\%) \log_e(20,000,000) = \$53 \times (1.09)16.81 = \222
- then changing the SLB to 12:
 - $\$222 \times (1 + 3.4\%) 12 = \333

We can now compare this same claim type to a standard employer. Again we begin with the \$100 baseline claim:

- Converting the baseline to a standard employer claim:
 - $\$100 \times 981\% = \981
- then following the same steps as before:
 - $\$981 \times (1 - 6\%) \log_e(20,000,000) \times (1 + 2.7) 12 = \$502.$