

# **Quality Assurance Review of PricewaterhouseCoopers' December 2007 Valuation of ACC's Outstanding Claims Liabilities**

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**Department of Labour**

**September 2008**

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## Quality Assurance Review of Half Year ACC Actuarial Valuation

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## Part I Executive Summary

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### 1 Introduction and Scope

This summary gives an overview of the Finity Consulting Pty Limited (Finity) review of the Accident Compensation Corporation's ("ACC") projected 30 June 2008 actuarial process and valuation report completed by PricewaterhouseCoopers (PwC) using data to 31 December 2007.

Finity's review has been conducted for the Department of Labour (the Department) to assist with their functions as advisor to the Minister for ACC on strategic directions and purchasers of services from the ACC in the form of the Non-Earners Account. Details are contained in Part II and Appendices of this report, which should be read for a complete understanding of the scope, process and conclusions.

This review has included a review of the actuarial process, reviews of each payment type valued by PwC and consideration of "global" actuarial assumptions that impact all payment types (including risk margins and economic assumptions) and overall valuation results.

### 2 Findings

#### Process

Based on our observations to date, in the short time period since commencing our review the PwC actuarial valuation process appears comprehensive and thorough. We do not perceive the close interaction between PwC and ACC to be of concern. We noted that comparison between PwC's projections and ACC's own internal projections for budgeting purposes highlighted some differences in non-fatal weeklies and attendant care. These differences apparently arose due to knowledge of prospective experience expected to be different to past by ACC but that was not communicated to PwC in time for the December review. In our view the close working relationship between PwC and ACC has the potential to add positively to PwC's valuation process and conclusions. Of course PwC must and do ensure adequate independence and that all actuarial assumptions are their own.

We note that PwC rely on ACC to provide costings for legislative or prospective operational changes. We have been advised that PwC verify the results of ACC's work and we therefore have no issues with this approach. PwC should document in their report the extent and nature of reliance placed on ACC where this is the case.

In the majority of cases, the valuation technique adopted by PwC is a Payments per Active Claim (PPAC) approach. Where appropriate this was modified to be based on individual claims characteristics (eg. Social Rehab for Serious Injuries). For some smaller or quite volatile payment types a payment decay method was used. We are of the

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opinion that the actuarial methodologies employed are appropriate for the payment types, extent of data and experience emerging in the ACC scheme.

There were two minor changes to methodology relating to unreported claims in Non-Earners Weekly benefits and Separating backdated attendant care from Social Rehabilitation. Both of these appear to be an improvement in approach.

We did not observe any tendency to 'gloss over' small parts of the business or apply a 'standard method' where it might not be most appropriate. Segmentation of benefits (and sub-benefits) does not appear to be inappropriate.

## ACC Dimensions

The ACC has been the monopoly provider of compensation in respect of bodily injury in New Zealand uninterrupted since 1974 except for a small period of privatised workers' compensation.

In recent years it appears that claim payments and liabilities have been growing faster than would be the case allowing for economic inflation and exposure changes alone. The ACC has advised that the predominant cause of this is in Social Rehabilitation provided to Serious Injuries and in Weekly compensation. These two payment types combined make up over 60% of ACC's total outstanding claims liabilities.

The total outstanding claims provision at 30 June 2008 projected from 31 December 2007 is \$17,572 million (including acclaims handling expenses of \$1,039 million and a risk margin of \$1,959 million). The split for each Account and movements between valuations as reproduced from the PwC report is shown in the following table.

**Table 1 – 30 June 2008 Provision by Account**

Account	Claims				
	Experience		Economic	Movement	Movement
	at 30 June 2008 & Modelling		Assumptions		
	\$m	\$m	\$m	\$m	%
Earners' (EA)	2,972	129	132	260	10%
Employers' (EM)	1,115	-15	43	28	3%
Treatment Injury (TI)	1,104	56	71	127	13%
Motor Vehicle (MV)	4,450	16	255	271	6%
Non Earners' (NE)	2,795	101	171	272	11%
Partnership Program (PP)	109	10	0	10	10%
Residual Non Work (RN)	980	26	46	72	8%
Residual Work (RW)	1,821	-48	79	30	2%
Self Employed (SE)	266	-11	10	0	0%
<b>Total</b>	<b>15,613</b>	<b>264</b>	<b>807</b>	<b>1,071</b>	<b>7%</b>
Risk Margin	1,959			205	12%
<b>Total Provision</b>	<b>17,572</b>			<b>1,276</b>	

The total provision and movements by payment type, also reproduced from the PwC report is shown in the following table.

**Table 2 – 30 June 2008 Provision by Payment Type**

Payment Type	Provision		Movement Due to			
	at 30 June 2008		Claims Experience & Modelling	Economic Assumptions	Movement	Movement
	\$m	\$m	\$m	\$m	%	
Non fatal weekly compensation	4,732	19	199	218	5%	
Fatal weekly compensation	412	1	14	15	4%	
Medical	1,092	7	55	61	6%	
Social rehabilitation - serious injury	4,876	138	323	460	10%	
Social rehabilitation - non serious	929	3	40	43	5%	
Vocational rehabilitation	148	1	6	7	5%	
Hospital rehabilitation	869	24	34	59	7%	
Other rehabilitation	550	15	26	41	8%	
Independence allowance	630	4	44	49	8%	
Lump sums	313	26	9	35	12%	
Ambulance and bulk billed	22	1	0	1	5%	
Claims handling expenses	1,039	25	57	82	9%	
<b>Total Net Central Estimate</b>	<b>15,613</b>	<b>264</b>	<b>807</b>	<b>1,071</b>	<b>7%</b>	
Risk Margin	1,959			205	12%	
<b>Total Provision</b>	<b>17,572</b>			<b>1,276</b>		

Movement due to economic assumptions (+\$807 million) is the largest single impact on the 30 June 2008 liability projected from 31 December 2007 compared to the previous 30 June 2007 projection.

The Earners' (+\$129 million) and Non-Earners (+\$101 million) Accounts had the largest dollar increases of the Accounts for non economic related changes. The Social Rehabilitation – Serious Injury Payment Type increased by \$138 million.

Detailed analysis by Payment Type focuses on non-economic movements in the liabilities.

#### “Scope Limitation”

PwC are advised that in their valuation, regulated fee increases are not to be accounted for unless and until they are approved by Cabinet. The majority of the movement in the Social Rehab Serious Injury Payment Type is as a result of this situation in which Cabinet approved increases to home based rehabilitation. This raises four questions about the appropriateness of performing a valuation of outstanding claims on this basis:

1. Whether it is truly a central estimate as required by actuarial and accounting standards.
2. Whether this approach introduces avoidable volatility in reported financial results.
3. How this flows through to setting fully funded levies in general and specifically for full funding targets of the residual accounts.
4. Whether the unfavourable volatility introduced is then overemphasised by key stakeholders as a significant source of superimposed inflation.

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For this review Social Rehabilitation for Serious Injuries has been impacted most by this valuation approach, however, it is possible for other payment types also to be effected in the future.

## Economic Assumptions

Past and short term future inflation assumptions are based on sound reasoning and are reasonable.

PwC changed their approach to setting discount rate assumptions and long term inflation assumptions at the 31 December review.

For discount rates, the changes proposed were intended to supplement actual New Zealand bond yield information (thinly traded) with external data to remove the artificially high volatility created in assumptions from year to year. In principle we agree that this is a sensible objective, provided that the resulting yield curve is an estimate of the true underlying New Zealand Government bond yields by duration. At the December review PwC incorporated the shape of "Supranational" bond yields to inform their judgement. We understand that PwC has not yet firmed up assumptions for the 30 June 2008 review; we will provide further comments as and when this is the case.

The second (related) change proposed by PwC is to introduce a fixed long term "gap" between projected inflation and discount rates beyond ten years into the future. The rationale is that economists do not provide forecasts beyond about five to seven years and that even allowing for external data the discount rates assumptions beyond ten years at best rely on extrapolation of shorter term securities.

Generally the "gap" between inflation and discount rate should be more stable than each individual assumption because it is common for inflation rates and bond yields to move somewhat together. We agree with PwC's approach here as long as historical analysis and economic theory used to set the assumption is applied consistently with PwC's discounting (forward rates) methodology. This is a technical actuarial question and one we will discuss with PwC once they have finalised or are close to finalising their assumptions for the 30 June 2008 review.

## Gradual Process Claims

The valuation for both Independence Allowance and Lump Sums is limited to claims reported up to 30 June 2008 (with reported defined as diagnosis or treatment) – claims made approach. Retrospectively allocating "claims made" gradual process claims to residual accounts seems to pose an interesting question in terms of full funding for these accounts post 2014. We will consider this issue further in our levies review.

## Key Findings by Payment Type

The most important findings of our review of individual payment types appear below:

*Social Rehabilitation for Serious Injuries:*

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- Aside from the impact of fee increases for home based rehab described above, the other key issue for this payment type is the assumption for future superimposed inflation. We have seen clear evidence of historical superimposed inflation of 8% to 9% per annum over more than ten years.
- Some of the observed historical superimposed is likely to relate to fee increases above LCI. We have not seen sufficient information to understand to what extent this is the case.
- Apart from fees, some other sources of superimposed in this payment type include:
  - ▶ Increasing attendant care hours due to ACC's own decisions or through aging
  - ▶ Changing mix of attendant care toward more costly contract arrangements or alternatives
  - ▶ Community integration alternatives to attendant care adding to rather than substituting for attendant care (potentially a short term impact only).
- On face value the PwC assumed short term assumption looks low. However, this needs to be seen in the context of the contribution of fee increases.
- PwC agreed to provide further ground up justification of their assumptions for the 30 June 2008 review. We are treating the question of superimposed as an open one until PwC complete this.
- In coming up with both short and long term superimposed inflation assumptions we would seek to see the sources of historical superimposed and justification of the extent to which each is to be mitigated going forward.
- More generally, for this very large payment type, the sources of uncertainty are not given sufficient weight in the PwC report.

*Social Rehabilitation – Non Serious Injury:*

- Although we have not observed historical superimposed to the same extent as for serious injuries, it is fair to say that in the long term some of the same drivers of cost exist with attendant care etc. for the non seriously injured. It may be worth PwC considering and documenting reasons for the very long term assumptions for superimposed being different.

*Non Fatal Weeklies:*

- Actuarial assumptions are seen to be appropriate out to development 25 years from accident. However, we have observed that PwC assume a declining payment per active claim after this time. No justification for this assumption is provided.
- Increasing PPACs beyond 25 years to be flat increases the liability for non fatal weeklies by around \$60 million or 1.5%. Further justification of the very long term PPACs should be included in PwC's report.
- We understand that ACC have some key performance indicators (KPIs) for continuance rates at 3, 6 and 12 months duration. We have not sighted the KPIs nor do we understand how the measures are compiled. However we understand that the performance of the actual continuance rates relative to the KPIs has been poor.

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This is an area of further investigation that will be undertaken as part of our review of the June 2008 full valuation.

*Independence Allowance:*

- PwC has relied on ACC's costing of the Fenemor decision and incorporated short term superimposed inflation in response. More detailed comments on this in the report and of PwC's verification of the original ACC analysis would be welcomed.

*Hospital Rehabilitation:*

- There is clearly superimposed inflation present in the experience for hospital rehab. The PwC rates selected of 6.0% p.a. for 2008 and 5.0% for 2009 are in line with the consistent level observed during the past ten years. However, the selected rate for 2010 and later of 1.5% p.a. seems low. Further justification of this lower assumption relative to recent experience should have been made in our opinion.

### **3 Recommendations**

1. Reliance on ACC - PwC should document in their report the extent and nature of reliance placed on ACC analysis as appropriate.
2. Social rehabilitation serious injury - provide support for short and long term superimposed inflation assumptions that specifically address changes expected to the emerging experience observed to date.
3. Social rehabilitation non serious injury - Greater disclosure of the justification of superimposed inflation assumptions.
4. Non fatal weekly benefits - include justification for the reducing PPAC assumption beyond development quarter 130.
5. Independence allowance and lump sums - Claims arising from future accident periods are not included in the liability estimate. We note that there is some uncertainty regarding the correct accounting basis for claims arising from earlier periods of exposure and we would seek to clarify this.
6. Hospital rehabilitation - Greater disclosure of the justification of the long term superimposed inflation assumption should be made.

### **4 Conclusions and Opinion**

Having carried out the review as described with the exception of open questions relating to superimposed inflation, inflating and discounting, nothing has come to our attention that would lead us to believe that the PwC valuation results at 30 June 2007 are unreasonable.

In future reviews we would like to understand experience for each Account more fully by investigating in further detail the experience by accident year and payment type for each. The information that we were able to review this time made this analysis difficult.

## **5 Reliances and Limitations**

The reliances and limitations to our work form an important part of this report and are included in full in Section 6. A reader of this executive summary should refer to the reliances and limitations to our work.

This report is being provided for the sole use of the Department for the purposes stated in Section 1 of this report. It is not intended, nor necessarily suitable, for any other purpose. This report should only be relied on by the Department for the purpose for which it is intended.

## **1 Introduction**

### **1.1 Purpose**

Finity Consulting Pty Limited (“Finity”) has been engaged by the Department of Labour (“the Department”) to carry out a quality assurance review of the half yearly valuation report prepared by PricewaterhouseCoopers Actuarial Ltd (“PwC”) undertaken for the Accident Compensation Corporation (“ACC”).

PwC’s half yearly actuarial valuation of ACC’s outstanding claims liabilities projects the liabilities to 30 June 2008 based on data to 31 December 2007.

The purpose of our review is to provide information to assist the Department in assessing the reasonableness of PwC’s assessment of outstanding claims liabilities and in particular to provide commentary on the drivers of claims costs. This report does not in itself directly provide advice to the Department in relation to the adequacy of Full Year results, levy setting or non-earner appropriations, however, it provides a lead indicator of issues that we wish to draw to the Department’s attention prior to reporting on these items later in the year.

This is the first occasion on which we have carried out such a review for the Department. Our work is being carried out in accordance with the Actuarial Services Contract signed and dated 11 June 2008.

### **1.2 Scope**

The scope of our review is defined as a “quality assurance review of the half year 31 December Valuation of ACC Outstanding Claims Liabilities”. Our review is specifically to address:

- Suitability of the actuarial methodology adopted.
- Suitability of the main actuarial assumptions having regard to recent experience.
- Spot check (but not an exhaustive check or full independent calculation) of valuation calculations; note that the information contained within the PwC report made this difficult to perform.
- Appropriateness of economic and discount rate assumptions.
- Recommendations of improvements to process or information.
- Identify and quantify significant changes to the valuation from the previous Full Year Valuation.
- Document significant changes by ACC Account.

### **1.3 Approach**

Our approach to carrying out this review has been as follows:

- we obtained a copy of PwC's 31 December 2007 valuation report and major appendices, with appendices provided as SAS datasets, spreadsheets or word documents ("PwC report")
- we interviewed the key PwC staff to understand their processes, hear their views on the most important aspects of the valuation and identify changes they intended to make for the June 2008 valuation
- we interviewed ACC's internal actuarial staff understand ACC's role in providing information to PwC and reviewing PwC's assumptions and results
- we interviewed ACC management to understand from their perspective the current operational and actuarial issues
- we reviewed the December report carrying out our own analyses where required
- in some cases we followed up PwC and ACC with questions arising from our review.

The approach has evolved during the course of the project to meet the requirements of the Department and the timing of PwC's June 2008 valuation. In many ways, this report has not sought closure on issues identified, noting that there remain open questions on the 31 December 2007 valuation that we expect will be investigated and/or commented on by ACC and PwC for the 30 June 2008 results.

The scope and purpose of our review were not aimed at a detailed review of PwC's calculations.

### **1.4 Materiality**

Wherever we have considered the materiality of an amount in the PwC valuation, assessment of materiality is judgemental relative to the total ACC liabilities using the definition of 'material' from the Institute of Actuaries of Australia's professional standard PS300 and does not necessarily conform to audit materiality levels.

### **1.5 Compliance**

Our report has been prepared as Actuarial Advice in accordance with the Code of Professional Conduct issued by the Institute of Actuaries of Australia.

Our scope of work does not constitute External Peer Review and accordingly our report has not been prepared in accordance with PS100.

### **1.6 Report Structure**

The remainder of our report contains the following:

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- Section 2 – sets out our understanding of the actuarial process undertaken by PwC
- Section 3 – comments on the actuarial assumptions affecting all payment types
- Section 4 – summarises the outstanding claims valuation results
- Section 5 – sets out our commentary on PwC’s valuation methodology
- Section 6 – sets out our recommendations and suggestions for improvement for future valuations

Detailed commentary on each of the payment types is given in appendices to this report.

## **2 Actuarial Process**

### **2.1 Overview**

We interviewed on 18 June 2008 ACC actuarial management and staff to understand the interaction between PwC and ACC. The PwC and ACC actuarial teams work closely together during the valuation. PwC relies on ACC for data, to identify emerging issues and other key areas.

### **2.2 Data**

ACC extract data “triangles” from the claims payment system (“EOS”) which is summarised by injury and experience quarter. Also provided to PwC is a “summarised” transactional history by claim showing quarterly payments by forecasting group (or payment type). The data available is from payment year 1992 and later but covers off all ACC injury years.

ACC provide evidence of reconciliations performed of the data to the General Ledger as well as between summarised triangles and transactional information.

In addition to the standard actuarial data, ACC normally provides “mini payment analysis” which drills further into General Ledger Account details for selected payment types where experience warrants. Generally ACC identify these areas and provide PwC with reports relating to the areas identified.

PwC perform reasonableness checks on the information received, in particular comparisons to the previous valuation data. Otherwise PwC rely on the ACC and any checks performed as part of the audit function.

Some data integrity issues were mentioned relating to minor miscoding however, these were considered immaterial. We note that a data quality project is underway which was expected to be completed by PwC’s 30 June 2008 review. We have not reviewed the results of this review.

We have concluded that the data is appropriate and the processes for extraction and checking rigorous and typical of large scheme valuations. We found no reason for concern about the adequacy or appropriateness of the data used by PwC.

Of note for the upcoming 30 June 2008 review is the transfer of around 1,000 claims from “non-serious” to serious injury status as they relate to the Social Rehabilitation valuation. These claims were identified by the new National Serious Injury Service (NSIS) unit within ACC and represent a change in coding practice rather than a change to reality. We will comment further on this in our review of the Full Year Outstanding Claims Valuation.

## 2.3 People

Between the December and June valuations the head of ACC's Actuarial team, Gavin Pearce, resigned from ACC. This caused minimal disruption because Ric Geisler has stepped in acting as his replacement. Ric had previously worked as ACC's Chief Actuary prior to Gavin. There were no changes in the other members of the ACC team.

We understand that the PwC actuarial team has remained relatively stable for many years.

## 2.4 Independence

ACC has good internal actuarial capability. There is a lot of interaction between this team and the PwC actuarial team in the provision of information and the discussion of actuarial assumptions and results.

This may raise a question about the extent to which PwC rely on ACC's internal views on experience and, potentially, whether the PwC valuation is sufficiently independent.

PwC's use of ACC information has been identified as taking one of three broad forms:

- when there has been a legislative or operational change which means that future claims experience is likely to diverge from the past, ACC's actuarial team model the change and estimate the liability impact. PwC may rely on these costings until such time as sufficient post-change data emerges. In such cases we saw were informed that PwC had formally reviewed ACC's costings before relying on them.
- PwC obtain a variety of input from ACC and other stakeholders on the environment. Generally this information is not relied upon directly but helps PwC to understand the observed claims experience. In the complex environment in which the ACC operates this is entirely appropriate.
- PwC projections of claims payments from their valuation are compared with ACC's own projections established for budget purposes. During the March quarter 2008 PwC were advised of differences particularly relating to Non-fatal weeklies and attendant care. PwC updated their letter in respect of "BEFU" budgets to reflect the ACC view. This leads to two questions which may require further investigation:
  - ▶ firstly, why this information that was allowed for in the ACC internal budgets was not communicated to PwC at the time of preparing their December results
  - ▶ secondly, the rigour of review by PwC of new assumptions leading to changes in the valuation.

We note that the 31 December valuation numbers were not changed.

In the time available to us our brief review of the PwC reports and discussions on PwC's interaction with ACC we were satisfied that the final selection of actuarial assumptions is PwC's own work and we have no concerns about the independence of the valuation. We

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would however encourage PwC to fully document their reliance on ACC in their valuation reports.

## 2.5 Internal Controls

PwC have rigorous technical review processes and systems in place for version control. We note that valuation models are stored in one place (Sydney) and remotely accessed by the Melbourne, Wellington and Auckland actuarial teams.

We were less clear on the internal peer review processes employed by PwC. Actuaries in each of the Melbourne, Sydney and Wellington offices are responsible for the valuation of certain payment types. We were advised that review takes place but that this was not completely locked in as to who does each review. We also note that a review partner has been involved in the recent reviews but that this role is also not clearly defined. We would encourage PwC to formalise their internal review processes to ensure all aspects of the valuation are reviewed.

## 2.6 Timing and Use of the PwC Report

This is more relevant to the 30 June Full Year Outstanding Claims Report and will be commented on further in our review of this PwC report. However, our initial discussions suggest that for Audit Committee and Board sign-off the full PwC report is not available and in place of this in the Board Papers are a presentation prepared by PwC, a "highlights" paper also prepared by PwC and a Board cover paper prepared by ACC.

We would seek to understand the content of each of the documents prepared for the Board and Audit Committee further.

## 3 “Global” Actuarial Assumptions

This section provides commentary on the key actuarial assumptions that apply to all payment types equally or that are set as a result of one process for all payment types.

### 3.1 Inflation

PwC has employed different methodologies for setting assumptions for short term inflation rates and long term inflation rates (beyond ten years). The long term inflation rates are closely linked to the long term discount rates and are described in the next section.

#### Past Inflation

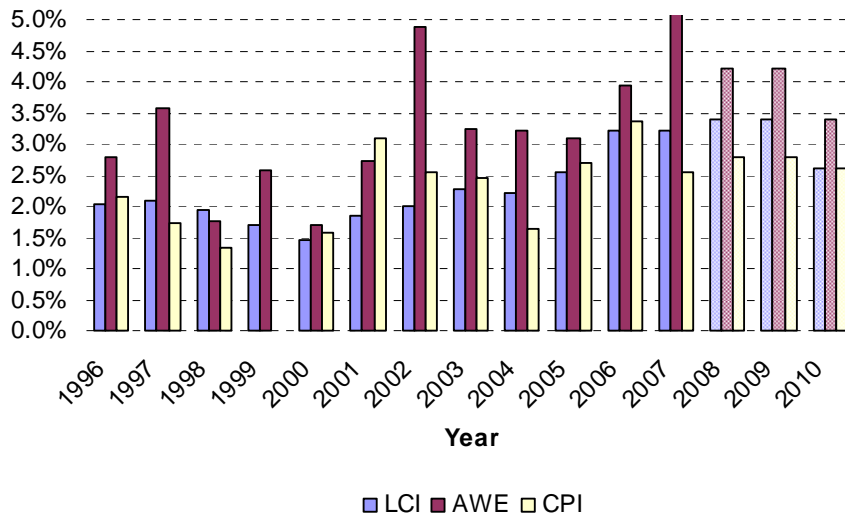
To bring historical payments into “current dollars” each past payment is inflated using actual past inflation indices. Different indices are used for different payment types and relate to the expected (legislated or otherwise) driver of claims inflation. The approach to past inflation is consistent with our expectation and is appropriate.

Non Fatal Weeklies uses historical Average Weekly Earnings (AWE) to inflate across injury period and historical Labour Cost Index (LCI) to inflate development periods within each injury period. This effectively allows for the fact that changes to the mix of workers by industry and employment type are expected from one period to the next (AWE) but once a worker is injured, their income replacement remuneration is linked to their employment at the time of injury which is expected to increase in line with LCI. This is a clever and appropriate way to incorporate past inflation.

#### Future Inflation

Forecast short term future inflation is set having regard to economists’ forecasts. Actual historical and projected inflation adopted by PwC are shown in the following figure. PwC adopt the same rate for years 2010 to 2018.

**Figure 3.1 – Past and projected (short term) inflation**



The rates seem consistent with historical averages. Also the relativities between the various indices also appear consistent with history. We do not have any issues with the projected short term inflation adopted by PwC.

### 3.2 Discount Rates and Long Term Inflation

The methodology for discount rates and long term inflation assumptions was changed for the 31 December 2007 review. The drive behind the revised methodology is to provide a more appropriately stable outstanding claims valuation between reviews that is not impacted by volatility in the New Zealand Government bond market (thinly traded) and, at the same time, has more regard to the “real” discount rate beyond ten years where local bond markets are almost non existent, as are economists’ forecasts of inflation.

The application of this changed methodology for the December review incorporated blending the shape of “Supranational” bond yields with the level of New Zealand Government bond yields to set discount rate assumptions. Long term “gap” assumptions (difference between inflation and discount rates) were set having regard to the historical difference between inflation and 2 to 10 year bond yields.

The changed methodology alone is reported to have decreased the projected 30 June 2008 liability by 2.7% or \$424 million.

We agree in principle with the idea of supplementing NZ bond yields with external data to help set a discount rate assumption that can be seen to equate to a proxy for NZ Government bonds given the thinly traded nature of actual NZ Government bonds. We also agree that a long term real yield assumption is appropriate for longer term durations based on appropriate historical observation and economic argument.

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We understand that the final detail to be implemented at 30 June 2008 has not been established and we will wait on this before commenting further on these economic assumptions.

### **3.3 Risk Margins**

PwC revised their assumptions for risk margins at the December review which resulted in a small increase in the margin required for 75% probability of sufficiency from 12.1% to 12.5%.

The methodology adopted by PwC appears reasonable and the reason for the increase (longer duration due to adding 1% long term superimposed inflation to Social Rehab for Serious Injuries) is consistent with expectations. However, there is limited commentary and analysis of actual historical volatility with which to assess the overall result.

## 4 Outstanding Claims Liability Summary

The outstanding claims liability for ACC has been growing at a rate faster than inflation plus exposure (population, workers or motor vehicles). The table below summarises changes in the incurred cost of claims (payments plus change in outstanding claims liabilities) for each year from 30 June 2003 to 30 June 2007. The table removes the impact of discount rate movements between the reviews and so attempts to show the “underlying” trends.

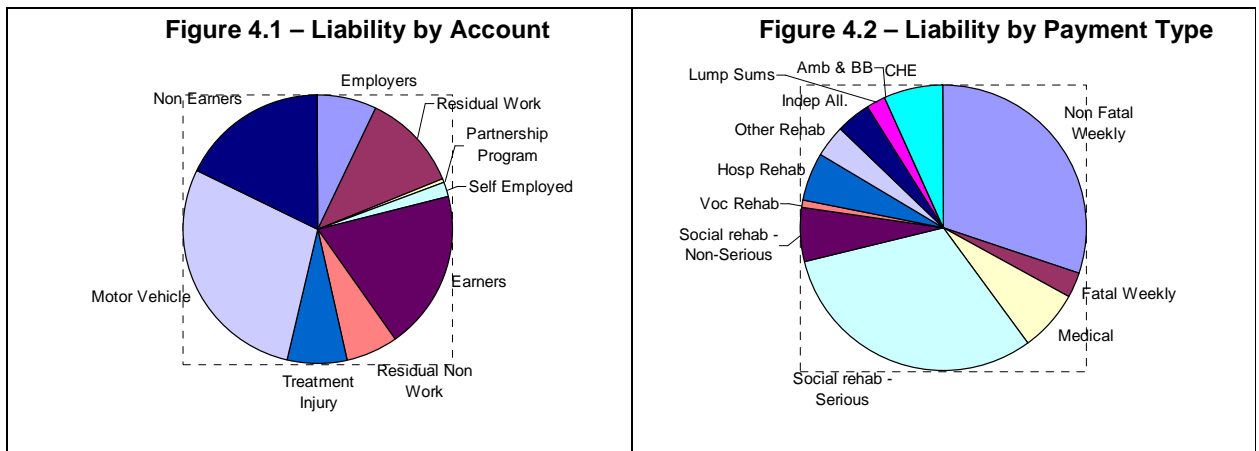
**Table 4.1 – Claim payments, outstanding claims and incurred costs**

	2007	2006	2005	2004	2003
Expenditure - Compensation	943,510	832,704	783,612	800,369	752,660
Expenditure - Rehabilitation	1,484,553	1,304,931	1,153,144	997,505	950,894
Underlying change in OSC	2,187,000	1,435,000	1,238,000	1,154,000	717,000
Incurred claims cost	4,615,063	3,572,635	3,174,756	2,951,874	2,420,554
Annual change	29%	13%	8%	22%	29%
Underlying OSC growth	16%	11%	11%	12%	8%
Payment Growth	14%	10%	8%	6%	8%

The 2007 year particularly shows some adverse movements in these aggregate scheme statistics. Underlying payment and outstanding claims growth of 6% to 8% is probably keeping pace with inflation and exposure increases.

At 31 December 2007 the projected 30 June 2008 outstanding claims provision was \$17,572 million (including a risk margin at the 75% probability of sufficiency of \$1,959 million and claims handling expenses of \$1,039 million).

Excluding the risk margin the outstanding claims liability is split by Account and Payment Type as follows.



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The largest Accounts in terms of liability are:

- Motor Vehicle (29%)
- Earners (19%)
- Non-Earners (18%).

The largest payment types in terms of liability are:

- Social Rehabilitation – Serious Injury (31%)
- Non Fatal Weeklies (30%).

#### 4.1 Changes from Previous report

PwC present changes in the experience and assumptions to September 2007 separately to changes in the December 2007 quarter. It was difficult to follow through the tables and commentary to obtain a clear view on the total changes since the previous valuation, however, we are satisfied that the detail in the report broadly lines up with the summary tables in section 2.2 of PwC's report.

In total the projected 30 June 2008 outstanding claims provision increased by \$1,276 million (7.8%) from \$16,296 million to \$17,572 million between the 30 June 2007 and 31 December 2007 actuarial reviews.

Experience and modelling changes were greatest for Social Rehabilitation – Serious Injury (+\$138 million) as a result of a recent Cabinet approval to substantially increase attendant care hourly rates. By Account, the greatest increases were within Earners (+\$129 million) and Non-Earners (+\$101 million).

The following tables shows the movements in recommended central estimate by account and by payment type.

**Table 4.2 – Movement in Central Estimate – By Account**

Account	Claims			Movement \$m	Movement %
	at 30 June 2008 \$m	Experience & Modelling \$m	Economic Assumptions \$m		
Earners' (EA)	2,972	129	132	260	10%
Employers' (EM)	1,115	-15	43	28	3%
Treatment Injury (TI)	1,104	56	71	127	13%
Motor Vehicle (MV)	4,450	16	255	271	6%
Non Earners' (NE)	2,795	101	171	272	11%
Partnership Program (PP)	109	10	0	10	10%
Residual Non Work (RN)	980	26	46	72	8%
Residual Work (RW)	1,821	-48	79	30	2%
Self Employed (SE)	266	-11	10	0	0%
<b>Total</b>	<b>15,613</b>	<b>264</b>	<b>807</b>	<b>1,071</b>	<b>7%</b>
Risk Margin	1,959			205	12%
<b>Total Provision</b>	<b>17,572</b>			<b>1,276</b>	

**Table 4.3 - Movement in Central Estimate – By Payment Type**

Payment Type	Provision		Movement Due to		
	at 30 June 2008 \$m	Claims Experience & Modelling \$m	Economic Assumptions \$m	Movement \$m	Movement %
Non fatal weekly compensation	4,732	19	199	218	5%
Fatal weekly compensation	412	1	14	15	4%
Medical	1,092	7	55	61	6%
Social rehabilitation - serious injury	4,876	138	323	460	10%
Social rehabilitation - non serious	929	3	40	43	5%
Vocational rehabilitation	148	1	6	7	5%
Hospital rehabilitation	869	24	34	59	7%
Other rehabilitation	550	15	26	41	8%
Independence allowance	630	4	44	49	8%
Lump sums	313	26	9	35	12%
Ambulance and bulk billed	22	1	0	1	5%
Claims handling expenses	1,039	25	57	82	9%
<b>Total Net Central Estimate</b>	<b>15,613</b>	<b>264</b>	<b>807</b>	<b>1,071</b>	<b>7%</b>
<b>Risk Margin</b>	<b>1,959</b>			<b>205</b>	<b>12%</b>
<b>Total Provision</b>	<b>17,572</b>			<b>1,276</b>	

We would seek to more fully understand the drivers of recent above inflation scheme growth at our review of the 30 June 2008 Outstanding Claims Review by cost driver and Account.

## 5 Recommendations and Suggestions

This sections sets out our recommendations and suggestions for PwC's full valuation at 30 June 2008. We have categorised as "recommendations" the areas we believe the current report is deficient and where we require further information to carry out our review. "Suggestions" are areas that, while not imperative, will make the report more user friendly and easier to understand.

Note that areas that we consider as open questions are not included in this section.

### 5.1 Recommendations

1. Reliance on ACC - PwC should document in their report the extent and nature of reliance placed on ACC analysis as appropriate.
2. Social rehabilitation serious injury - provide support for short and long term superimposed inflation assumptions that specifically address changes expected to the emerging experience observed to date.
3. Social rehabilitation non serious injury - Greater disclosure of the justification of superimposed inflation assumptions.
4. Non fatal weekly benefits - include justification for the reducing PPAC assumption beyond development quarter 130.
5. Independence allowance and lump sums - Claims arising from future accident periods are not included in the liability estimate. We note that there is some uncertainty regarding the correct accounting basis for claims arising from earlier periods of exposure. We recommend that this basis be clarified.
6. Hospital rehabilitation - Greater disclosure of the justification of the long term superimposed inflation assumption should be made.

### 5.2 Suggestions

1. As a general comment across the whole report, we found that:
  - (a) there was not a lot of commentary on trends in the experience and rationale for the selection of valuation assumptions - It would be helpful if the report (or appendices) contained more information comparing experience to the adopted valuation assumptions and commentary on the rationale for the selections
  - (b) it was difficult to extract the relevant figures from the report to fully understand the analysis of change between valuations. The documentation of this could be streamlined
  - (c) greater disclosure of undiscounted as well as discounted liability estimates would be helpful for the reader
  - (d) inclusion of a list of supporting appendices in the table of contents would be helpful, particularly as the appendices are provided as excel spreadsheets and

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SAS datasets. The list would ensure all supporting appendices are provided with the main text of the report.

2. Internal controls - We would encourage PwC to formalise their internal review processes to ensure all aspects of the valuation are reviewed.
3. Social rehabilitation serious injury - Consider including sensitivities to major assumptions including “best estimate” attendant care rate increases.
4. Medical physiotherapy - Clearer documentation of the reasoning or analysis supporting the different superimposed inflation assumptions would be useful.

## **6 Reliances and Limitations**

### **6.1 Distribution and Use**

This report is being provided for the sole use of the Department of Labour (the Department) for the purposes stated in Section 1 of this report. It is not intended, nor necessarily suitable, for any other purpose. This report should only be relied on by the Department for the purpose for which it is intended.

We understand that the Department may wish to provide a copy of the report to the ACC, Ernst and Young (in their capacity as auditor to the ACC) and PwC. Permission is hereby granted for such distribution on the condition that the entire report, rather than any excerpt, be distributed. No other distribution of this report is permitted without our prior written consent.

Third parties, whether authorised or not to receive this report, should recognise that the furnishing of this report is not a substitute for their own due diligence and should place no reliance on this report or the data contained herein which would result in the creation of any duty or liability by Finitly to the third party.

Any reference to Finitly in reference to this analysis in any report, accounts or any other published document or any other verbal report is not authorised without our prior written consent.

Finitly has performed the work assigned and has prepared this report in conformity with its intended utilisation by a person technically competent in the areas addressed and for the stated purposes only. Judgements about the conclusions drawn in this report should be made only after considering the report in its entirety, as the conclusions reached by a review of a section or sections on an isolated basis may be incorrect.

The report should be considered as a whole. Members of Finitly staff are available to answer any queries, and the reader should seek that advice before drawing conclusions on any issue in doubt.

### **6.2 Data and Other Information**

Finitly was provided with PwC's valuation report that is the subject of this review. We have relied on the accuracy and completeness of all data and other information (qualitative, quantitative, written and verbal) provided to us for the purpose of this report. We have not independently verified or audited the data. It should be noted that if any data or other information is inaccurate or incomplete, we should be advised so that our advice can be revised, if warranted.

### **6.3 Nature of the Review**

This quality assurance review is a review for reasonableness. It should be noted that the quality assurance review has not provided (nor is it intended to provide) an independent estimate of the liabilities for ACC. Nor is this quality assurance review intended to

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provide verification that each of the detailed calculations underlying the calculation of the liabilities is correct. The review does not extend to providing a guarantee of PwC's advice.

It is not possible to put a value on insurance liabilities with certainty. As well as difficulties caused by limitations in the historical information, outcomes remain dependent on future events, including legislative, social and economic forces. Deviations are normal and are to be expected. Whilst the quality assurance review may act to increase the confidence in the judgements made in selecting assumptions, it does not reduce the inherent uncertainty of the eventual outcome.

## **A Methodology**

This section includes our commentary on PwC's adopted valuation methodologies.

### **A.1 Payments Per Active Claim Method**

Quarterly Payments per Active Claim models are adopted for valuing the following payment types:

- Non fatal weekly benefits
- Fatal weekly benefits – split into dependants and spouses. Adjustments are made to allow for spouse capitalisations
- Medicals – split into GPs, physiotherapists, radiologists and other
- Social rehabilitation non serious injury – excluding capital
- Vocational rehabilitation
- Hospital rehabilitation
- Independence allowance (modified – see below).

Active claims are defined as claims that received at least one payment of the type being valued in the quarter. There is a separate model for each account, although the assumptions adopted for each of the work accounts are the same, as are the assumptions for each of the earners accounts.

The expected number of active claims in the first 30 development years (i.e. duration post injury) were projected based on valuation assumptions derived from historic trends in the number of active claims. The number of active claims beyond development year 30 were set after considering the age profile of currently active claims, and future discontinuance assumptions allow for retirement and death only.

Past payments are inflated as described in Section 3.1. Payments per active claim (PPAC) in current values are calculated and valuation assumptions selected.

Seasonality is allowed for in the active claims and payments.

Allowance is made for future inflation (see section 3.1) and discounting (see section 3.2). Allowance for superimposed inflation for each payment type is discussed sections 7 to 21.

#### **Independence Allowance**

PwC used a variant of the PPAC method, with individual projection of the number of active claimants. The standard PPAC methodology is not thought to be appropriate

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because of changes in legislation over time, and because of claimants' option to capitalise. It is reasonable to adapt the methodology to reflect these features of the experience.

## A.2 Payment Decay Method

The payment decay method is adopted for the following payment types:

- social rehabilitation non serious injury – capital
- other rehabilitation – separately for backdated attendant care and non backdated attendant care.

This method involves analysis of the decay in total payments by duration from accident.

## A.3 Individual Claim Projection

An individual claim model is adopted for valuing social rehabilitation for seriously injured claimants. Serious injury is defined by injury type (see Section 7).

Splitting out serious injuries in the valuation is a sensible approach given the differences in the shape and duration of the payments in question and the improvements in projections potentially generated by obtaining detail on individuals' age, attendant care requirements and other personal details.

For "established" accident periods, PwC project future attendant care costs for each currently active individual claim allowing for:

- Age
- Injury
- Current payments.

Discontinuance is incorporated for higher than population mortality. This loading differs by injury with more severe injuries receiving a heavier loading.

For less mature accident years, payments are projected based on the mix of injuries and reflecting historical averages for each injury. We understand that other claimant characteristics such as age are also taken into account.

Allowance is made for yet to be reported claims (IBNR) for which historical average assumptions are adopted.

## A.4 Payments per Claim Settled

PwC used a payment per claim settled approach for lump sums separately for asbestos related and non asbestos related claims. The method involves first estimating the number of future claims for each accident period. The estimated future liability is obtained by multiplying this by an assumed average claim cost. This amount is then inflated and discounted to the valuation date.

## **A.5 Ambulance and Bulk Billing**

PwC's estimated provision is 5% of the total paid for this payment type in the year prior to the review. This is based on information provided by ACC that there is an average delay of two weeks from accident to payment.

Two weeks would seem to be a reasonable delay between a service provider incurring an expense and receiving payments from ACC. This method could therefore be expected to cover costs arising from accidents which only required a single treatment. Costs arising from a long course of medication or other treatments could be expected to be paid much more than two weeks after an accident. However, we understand from a previous PwC report that payments occurring more than two weeks after an accident are not included in this payment type.

## **A.6 Claims Handling Expenses**

PwC estimate claim handling expenses as a proportion of future claim payments. Separate assumptions are made by category of expense, account and duration since injury.

## **A.7 Changes since June 2007 Valuation**

There have been two modelling changes since the 30 June 2007 valuation:

- the way continuance rates are set for the Non Earners account has been modified to explicitly allow for modelling of new claims reported and continuance of claims already reported
- Backdated attendant care has been modelled separately to the rest of other rehabilitation.

We cannot identify the impact of these individual changes from the information presented.

## **A.8 Conclusion**

The methods adopted for each payment type are appropriate.

## B Social Rehabilitation for Seriously Injured Claims

Social Rehabilitation for Seriously Injured claimants comprises the provision of attendant care, home help, education support, residential support/accommodation and the assessments and planning required to establish need for these services.

Items such as home and vehicle modification and purchase, aids and equipment are also included under the Social Rehabilitation umbrella. Because of the different nature of these “capital” payment types they are modelled separately to the attendant care etc. payments types. This is appropriate.

The 30 June 2008 outstanding claims liability projected from 31 December 2007 for Social Rehabilitation for Serious Injury is \$4,876 million. The PwC report explains the difference to that projected from the June 2007 in various sections of their report. The following table summarises the non-economic components of these movements.

**Table B.1 - 30 June 2008 Liability, Social Rehab Serious Injury  
Capital and Non-capital (\$m)<sup>1</sup>**

Account	Projected at 30/6/07	Experience & Model Changes	Projected at 31/12/07	% change	Approximate Proportion of Liability
Employers					1%
Residual Work					3%
Partnership Program					0%
Self Employed					0%
<b>Total Work</b>		<b>9</b>			<b>5%</b>
Earners					10%
Residual Non Work					5%
<b>Total Earners</b>		<b>49</b>			<b>15%</b>
Treatment Injury		29			12%
Motor Vehicle		9			42%
Non Earners		41			27%
<b>Total</b>	<b>4,738</b>	<b>138</b>	<b>4,876</b>	<b>2.8%</b>	<b>100%</b>

<sup>1</sup> after allowance for changes in economic assumptions

The experience and modelling changes in Table B.1 group the those shown in the PwC report in Section 14.3 (relating to September 2007 quarter analysis) and Section 25.2 (relating to December 2007 quarter experience only). The majority of the \$138 million (2.8%) increase in liability is due to PwC incorporating recently approved increases to home based rehabilitation hourly rates (\$128 million). Other impacts on PwC’s valuation include:

- a net negative impact of reclassification of claimants into the Serious Injury category
- increases to Capital PPACs responding to recent experience.

The major contributor to the liability strengthening relates to hindsight incorporation of Cabinet approved home based rehabilitation hourly rates. This highlights the potential

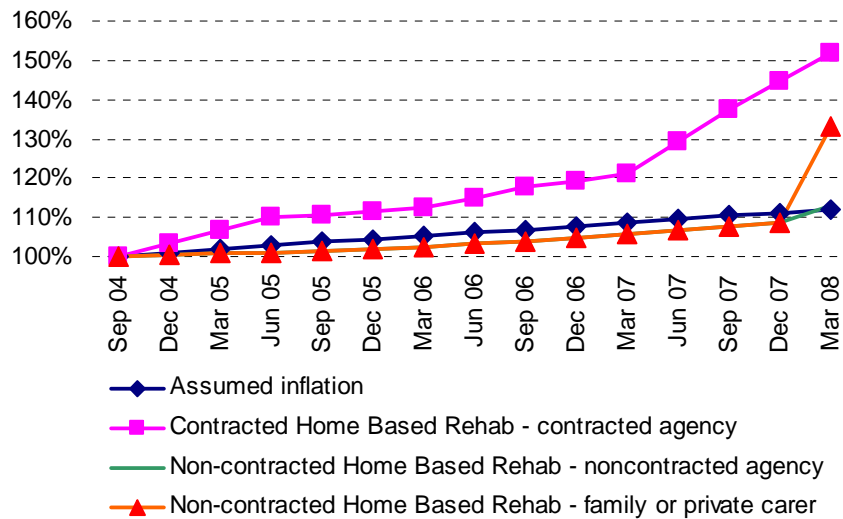
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for “unexpected” rate changes to drive increases in liability (and therefore decreases in funding level). While we recognise that PwC’s valuation approach with respect to regulated rates is consistent with the scope of their review it raises three concerns, one accounting/actuarial, one operational and finally one communication:

- It is not clear that this scope restriction meets international accounting requirements or that the liability estimate (before risk margins) is truly a central estimate.
- Unnecessary volatility in financial results is introduced by not projecting future increases in regulated rates consistent with reasonable expectations.
- Confusion for stakeholders around the existence of superimposed inflation measured as actual cost increases compared to PwC’s scope limited valuation basis.

The figure below shows that for recent years the hourly rate increases for attendant care provided by contract agencies and home based providers has differed from LCI (PwC’s scope limited assumed inflationary driver of rate increases for attendant care).

**Figure B.1 - Recent historical attendant care rate increases vs LCI**



Source: ACC

Over the period September 2004 to March 2008 the following increases in home based rehabilitation over and above LCI inflation have been observed:

- Contracted Home Based Rehab – 9% p.a. (40% at the end of the 3.5 years).
- Family or private carer – 5% p.a. (21% over the 3.5 years but all emerging in the March 2008 quarter).

We recognise that the picture is not complete without significantly more historical experience and without including alternatives to attendant care (such as residential support). However, the recent period for attendant care rates presents evidence that a central assumption of future rate increases lies above LCI.

## B.1 Superimposed Inflation

At their 31 December 2007 review, PwC assumed superimposed inflation of 5% per annum for four years followed by 1% per annum for the long term. The long term for this payment type extends for the life of existing claims which for young claimants could be 60, 70 or even 80+ years.

Note that superimposed inflation typically emerges in bursts rather than as a constant rate in excess of economic inflation each and every year. However, for valuation purposes, it is not unusual to adopt a smooth long-term rate because the onset, severity and duration of superimposed inflation are not possible to predict with certainty at the time of valuation. PwC do attempt to quantify the level and duration of recently observed superimposed inflation.

In terms of the long term assumption, it is almost an impossibility to objectively justify or assess as improper an actuarial assumption that is so long term in nature. However, the nearer term assumptions can be guided by emerging experience.

### Sources of superimposed inflation

Within Social Rehabilitation, likely sources of superimposed inflation include:

- Increased numbers of hours of attendant care (or equivalent) either for existing claims or for new claims coming on; may be as a result of aging or poor decision making by ACC, previous under servicing or other.
- Change over time away from less expensive care providers (eg family member) to more expensive alternatives (eg contracted agency). This could also relate to level 1 providers compared with level 2.
- Alternatives to attendant care (community based activities) adding to rather than substituting for attendant care.
- Pressure on rates paid to attendant care providers (out of scope).

Our understanding is that the last of these points is out of the PwC valuation scope. The third point is more of a prospective issue with the management changes proposed to be implemented by the National Serious Injury initiative. The first two sources are likely to have existed to some level in the observable experience. However, the data, analysis and commentary associated with the PwC report are not sufficient to separate these effects or to separate the impact of rate increases.

### Our Analysis

We have analysed historical payments per active claim for Social Rehab Serious Injuries presented Appendix L of PwC's report. Our analysis consisted of a GLM model separating movements in PPACs into accident year, development year and payment year effects.

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The table below shows the payment year impact isolated from the other two.

**Table B.2 - "Superimposed Inflation" 1996 to 2007 Social Rehab Serious Injury by Injury**

Year (1)	PwC Estimate (2)	Finity Estimate Overall (3)	High Level Tetra (3)	LL Tetra/HL Para (3)	Para (3)	TBI Adult-Severe (3)	Sev to Mod TBI (3)	Comp Diagnosis (3)	Incomplete SCI (3)
1996		12%	19%	4%	4%	13%	10%	36%	5%
1997		18%	19%	9%	1%	33%	16%	9%	16%
1998		15%	14%	4%	-9%	15%	29%	8%	-1%
1999		5%	13%	-1%	7%	16%	-3%	-8%	-2%
2000	8%	4%	7%	12%	-10%	11%	0%	6%	-29%
2001	12%	12%	10%	4%	10%	7%	30%	11%	13%
2002	4%	8%	11%	19%	7%	20%	-2%	21%	14%
2003	3%	15%	34%	16%	52%	4%	16%	14%	30%
2004	8%	8%	-10%	37%	16%	9%	9%	4%	1%
2005	6%	1%	6%	-18%	-10%	12%	-4%	14%	5%
2006	13%	10%	26%	15%	17%	4%	5%	-1%	23%
2007		4%	-1%	-3%	18%	1%	12%	18%	-2%
2008									
Average(1996-2007)		9%	12%	7%	7%	12%	9%	10%	5%
Average(2000-2007) (4)	8%	8%	10%	9%	11%	8%	8%	11%	5%
Average(2006-2008)									

(1) Payment Year ending March

(2) Dec year end (PwC estimate - from June 2007 report and TF EPR)

(3) Finity GLM estimate normalising for development/accident year

(4) Average to 2006 for PwC estimate

A previous Taylor Fry report<sup>1</sup> documented a table of superimposed inflation as measured by PwC for the 2000 to 2006 years at an average of over this period of 8% p.a. Our own analysis shows some differences for individual years (even after considering that the year ends are slightly different). However, over the same period we have also measured an average 8% p.a.

We observed large differences by injury for individual years, however, averages over the longer term show remarkably similar results. For all injuries in total and payment years 1996 to 2007 we have measured past superposed inflation averaging 9% per annum.

It would be very useful to understand the extent to which attendant care and other rate increases have contributed to the observed past superimposed inflation. A recent draft report by Maree Dyson<sup>2</sup> suggests that attendant care is provided by contracted and non-contracted providers in roughly a 50/50 split. Information in Figure B.1 shows that rate increases weighted in this way produces increases roughly 5% above inflation for the recent period. If this were a feature of the long term historical experience then say half of the observed superimposed may be explained by rate increases over and above LCI.

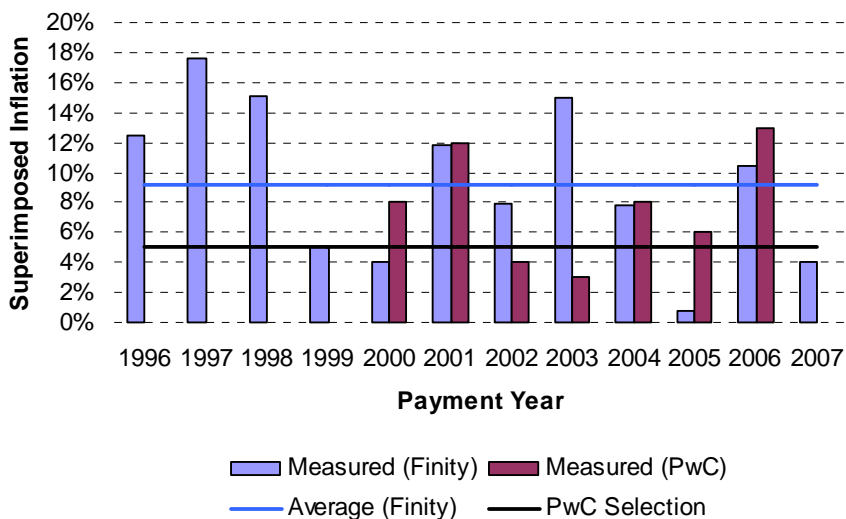
## Observations

Without any restrictions on which source of superimposed inflation to include, a short term assumption guided by the last ten years or so of history would be an appropriate starting point. The chart below shows the observed average (1996 – 2007) compared with PwC's assumption

<sup>1</sup> Review of the PricewaterhouseCoopers contributions to the March 2007 Budget Economic and Fiscal Update for the Accident Compensation Corporation

<sup>2</sup> Response to Actuarial Queries Regarding Impact of National Serious Injury Service, Clients with a Serious Injury and Aging of Carers – Dyson Consulting Group

**Figure B.2 - Historical SI for all injuries combined with PwC selection**



A selection of 7% to 9% per annum (less the impact of fee increases) could be supported. It is not possible to determine from the information presented in PwC’s report whether or not their 5% per annum assumption is reasonable. Also, it is a matter of considerable judgement as to the duration with which to maintain projected superimposed at this level.

The long term assumption must also incorporate significant judgemental considerations. While PwC’s assumed 1% per annum is low in comparison to recent history, as mentioned this assumption represents a view on the very long term prospective average rate.

PwC have undertaken to complete a comprehensive investigation in support of the superimposed inflation assumption that they will adopt at 30 June 2008.

**Further work proposed by PwC**

In recent discussions PwC has indicated their aim to provide “positive assurance” of the adopted short and long term superimposed inflation assumptions prior to finalising the 30 June 2008 valuation results. In fact, they intend circulating this by 2 July 2008.

PwC is of the view that recently observed superimposed inflation is not a reasonable starting point for setting very long term assumptions, in light of changes to management approach recently rolled out.

In addition to pressure on hourly rates, PwC believe that historical superimposed has been as a result of increasing the provision of care from levels below adequate up to reasonable levels of care. While they recognise that it is not possible to exactly benchmark to other schemes, we understand that part of the analysis by PwC will be to compare levels of total care (including residential and other alternatives to attendant care) with the TAC and also with the Motor Accident Authority’s spinal guidelines.

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PwC also propose drawing out parallels with the historical experience of the TAC and the ACC as evidence of the possibility of turning the ACC scheme experience around (as the TAC has achieved).

We note that the liabilities of the TAC includes an overall 1% per annum superimposed assumption. However, this is in addition to an explicit assumption of 5% per annum for claims that are currently receiving less than average care for their injury. We believe this to be equivalent around 2% per annum overall.

While we acknowledge that benchmarking to other schemes is a very useful exercise to undertake, we feel that discounting the actual historical ACC experience because of the significant changes to claims management may be discounting too much some potentially very useful information. In particular, isolating as far as practical the historical sources of superimposed inflation may allow a more informed call on which components are likely to remain and for how long following complete roll out of the NSIS initiatives.

PwC expected to retain a higher short term superimposed inflation assumption to account for below average claims increasing at a faster rate than those above average and to capture any remaining momentum of the recent experience.

### Recent Maree Dyson Report

The recent report by Maree Dyson indicates areas where increases in attendant care over time are to be expected or are as yet unclear. These include:

- Paraplegic injury types which are expected to require higher levels of care with aging
- All injury types after they reach 65 years of age
- Possibility that the extent to which family care will become agency provided as carers age – some increase would be expected (but not a short term issue)
- Children, youth and young adults have in the recent past driven overall cost increases.

While not specifically identified as a future growth area, Maree highlights that only 57% of high level tetraplegic injuries have received attendant care. It is possible that they are in receipt of alternatives.

Maree expects that some of the above sources of care increase will be offset by the introduction of attendant care service guidelines and benchmarks by lesion level. Clearly these offsets cannot continue indefinitely and we would be looking to PwC to incorporate their expected net impact of the above in their superimposed inflation assumption.

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## Conclusion on Superimposed Inflation

In addition to benchmarking to TAC and MAA we would encourage an attempt to explain historical superimposed inflation within the ACC history as practically as possible and to point to those specific areas that are expected to decline. This will lend credibility to the PwC assumption as well as enabling monitoring of actual versus expected going forward.

We would look to PwC to qualitatively address the cost pressure areas indicated in Maree Dyson's report for the long term assumption.

We support PwC's long term rate being different to a short term superimposed inflation assumption. There are clearly inefficiencies in the current provision of care and the scheme will quickly become unaffordable should it continue unabated to grow at 7% to 9% above inflation. However, once the scheme is operating at best practice, there still remains underlying cost pressures which we expect PwC to comment on in their review.

## B.2 Experience to 31 December 2007

PwC comment in their report in two separate sections on the experience and modelling changes that have impacted on the projected 30 June 2008 liability estimate changing between the previous 30 June 2007 report and the 31 December 2007 report.

It is difficult to follow through all impacts from the recent review however, the descriptions are consistent with the tabulated impacts shown in Sections 14.3 and 25.2.

For Social Rehabilitation Serious Injury, PwC project continuance rates and PPACs on individual claims that are more than four years after injury. For more recent periods they project aggregated continuance and PPACs based on age and injury profile. For claims yet to be reported (IBNR) they project based on aggregate averages. Their modelling approach appears reasonable.

PwC's projection of Serious Injury relates to claims that are currently classified as serious. Any claim that had previously been serious but has been reclassified as non-serious will be valued in the non-serious models.

Assumptions are set based on analysis of the historical experience of those claims currently classified as serious. If there is a bias to claims moving predominantly into serious or out of serious (i.e. it is not net neutral) the selected assumptions may not reflect the prospective experience of the claims that will be "serious" at each future point in time. At 31 December 2007, this reclassification of non-serious claims into serious increased the valuation result for serious injuries by around \$80 million.

Because there is an explicit IBNR for serious injuries, we believe that the approach adopted by PwC may produce a slightly conservative valuation result as it allows for cases reclassified as serious in the serious injury valuation but not so in the non-serious valuation.

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Between the 31 December 2007 valuation and the 30 June 2008 valuation there were around 1,000 claims identified by NSIS and reclassified as serious injuries. We are as yet not aware of the treatment of these additional claims and the impact if any of the total serious and non-serious injury valuation.

The remainder of this section continues the focus on Social Rehab for Serious Injuries.

### Continuance Rates and PPACs

Claims are projected to receive ongoing Social Rehab (non-capital) payments at recent levels until death. The only discontinuance allowed for is mortality, in excess of standard population mortality with the assumed mortality rate higher for more seriously injured claimants.

The same active claims projection is used for both the capital and non-capital payment models. PwC appear to have allowed for this appropriately in their selection of PPACs for capital payments.

One complication that PwC has also allowed for is the presence of significant back-dated attendant care. PwC cap these payments and load their assumption to allow for the existence of these types of payments in the future. This appears reasonable.

Because PwC project individual claims, comparing projected continuance rates and PPACs with the aggregated historically observed experience is not ideal and can provide a broad indication of reasonableness only. We do not present these here.

### **B.3 Uncertainty**

Even though the ACC has been established for 34 years, there is still considerable uncertainty in the projections of future social rehabilitation requirements for serious injuries.

Generally PwC do not provide sufficient commentary on uncertainty for this payment type. Sources of uncertainty that should be included are those in which we commented in the superimposed inflation section above.

### **B.4 Conclusion**

We conclude that the methodology and assumptions are appropriate. Based on our review and pending further support for the superimposed inflation assumption we conclude the liability for this payment type is not unreasonable.

### **B.5 Suggestions**

Consider including sensitivities to major assumptions including “best estimate” attendant care rate increases.

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## **B.6 Recommendations**

Provide support for short and long term superimposed inflation assumptions that specifically address changes expected to the emerging experience observed to date.

## C Social Rehabilitation for Non Serious Injuries

Social Rehabilitation for Non Serious Injuries values the provision of all of the same payments as Social Rehab in the preceding section but for non-seriously injured claimants.

### C.1 Result

The projected 30 June 2008 outstanding claims liability projected from 31 December 2007 data for social rehab – non serious, both capital and non capital, is \$929 million. The following table shows this liability as at 30 June 2008 compared with the same estimate projected from 30 June 2007 data, noting that changes in economic assumptions are excluded from the comparison.

**Table C.1 - Social Rehab Non Serious – 30 June 2008 (\$m)<sup>1</sup>**

Account	Projected at 30/6/07	Experience & Model Changes	Projected at 31/12/07	% change	Approximate Proportion of Liability
Employers					3%
Residual Work					51%
Partnership Program					1%
Self Employed					1%
<b>Total Work</b>		-27			55%
Earners					8%
Residual Non Work					3%
<b>Total Earners</b>		3			11%
Treatment Injury		19			7%
Motor Vehicle		9			14%
<b>Non Earners</b>		1			12%
<b>Total</b>	926	3	929	0.3%	100%

<sup>1</sup> after allowance for changes in economic assumptions

Across all accounts, the current estimate of the liability as at 30 June 2008 is only 0.3% higher from that projected as at 30 June 2007. From the information presented we are unable to show the projected liability as at 30 June 2008 from the 30 June 2007 valuation by account on the current economic assumptions.

The largest account is the Residual Work Account (51% of the overall liability).

### C.2 Experience in Six Months to 30 September 2007

The actual experience, in terms of both active claims in the September quarter and payments made, was materially lower than expected (actual was 88% of expected for continuance rates and 90% for payments). PwC attribute most of this variation to delays in approvals for elective surgery. Adjusting for this factor, PwC state that the experience was marginally favourable.

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### C.3 Valuation Assumptions

#### Continuance Rates

The following charts show the continuance rates for various development quarters for all accounts combined.

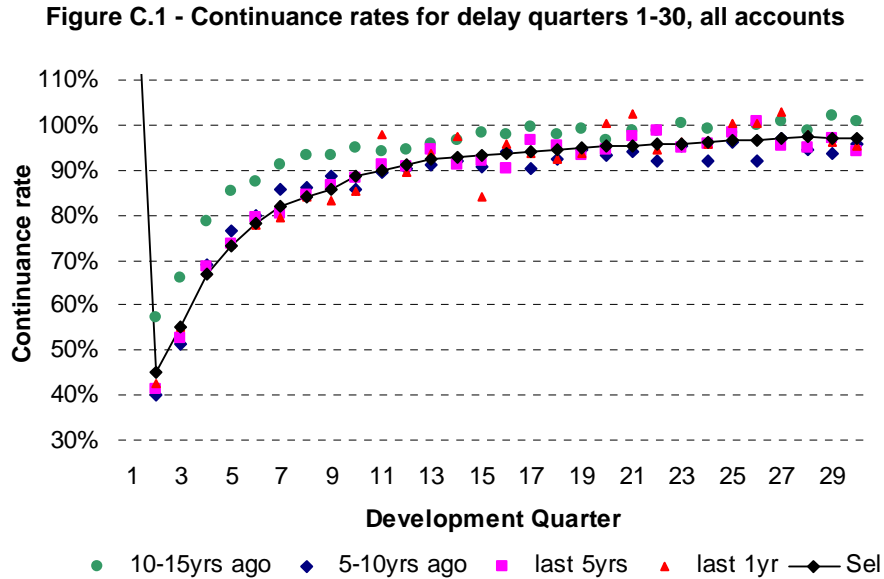
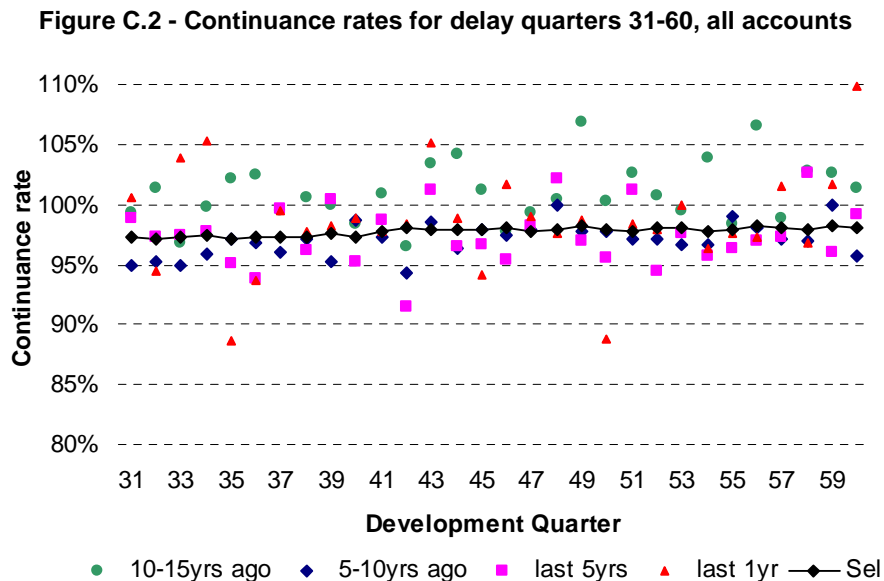


Figure C.1 above indicates that continuance rates for the early development quarters have been fairly stable over time though reducing from those 10 to 15 years ago. The selected rates appear reasonable.



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In Figure C.2 above the actual experience is volatile and there is no discernable trend. The selections appear to be appropriate.

**Figure C.3 - Continuance rates for delay quarters 61 and later, all accounts**

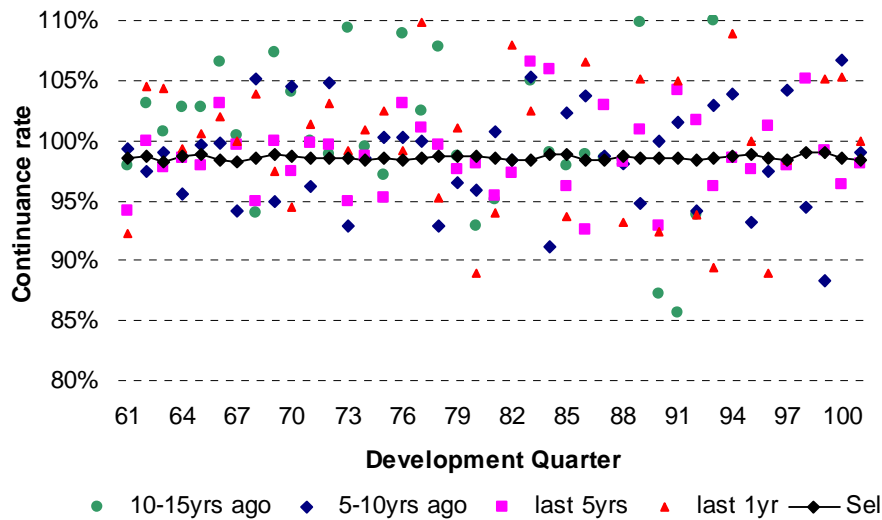


Figure C.3 also shows no clear trend in continuance rate experience over time. The selected rates for these later delay quarters are close to 100% and appear reasonable.

Overall we had no material concerns with the PwC continuance rates selected.

### PPACs

The following charts show the PPAC assumptions for the same development quarter groupings as for continuance rates above, across all accounts.

**Figure C.4 - PPACs for delay quarters 1-30, all accounts**

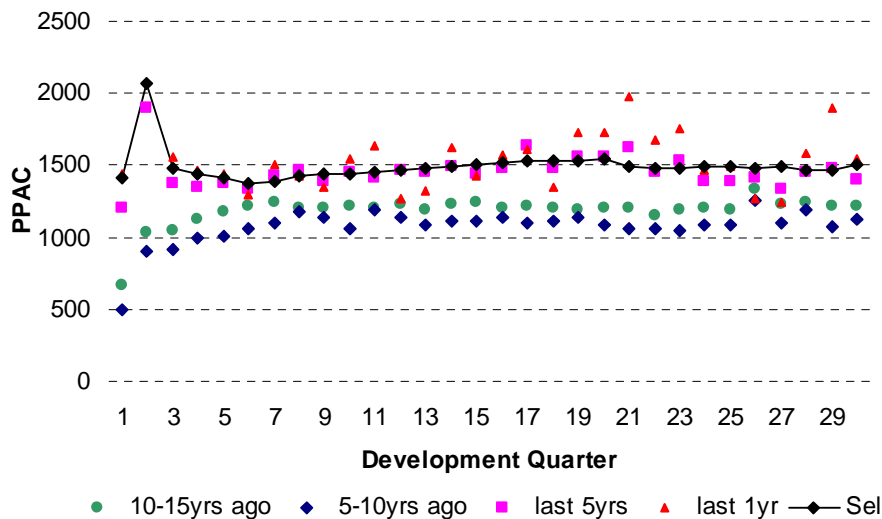


Figure C.4 illustrates that the level of PPACs has increased significantly from 10-15 years ago. This feature has been observed for other benefits (e.g. hospital and vocational rehab).

**Figure C.5 - PPACs for delay quarters 31-60, all accounts**

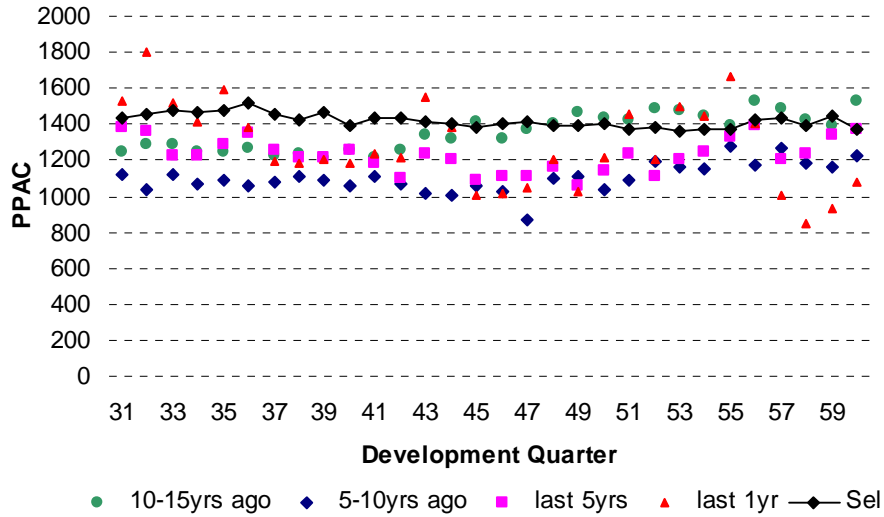


Figure C.5 shows that the recent experience is below PwC’s assumption although PwC’s assumed PPACs for these delays are consistent with earlier delays and not unreasonable.

**Figure C.6 - PPACs for delay quarters 61 and later, all accounts**

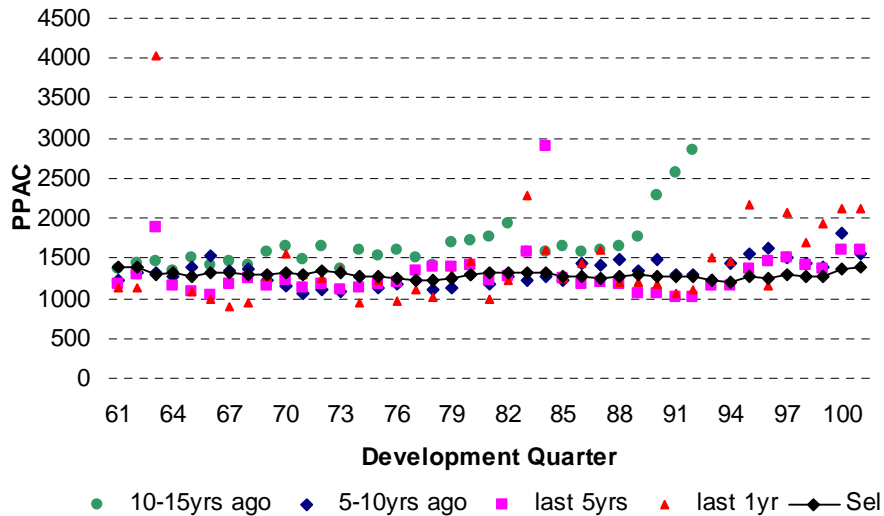


Figure C.6 shows similar experience regarding the levels of PPAC for different experience periods. PwC has selected PPACs in line with experience.

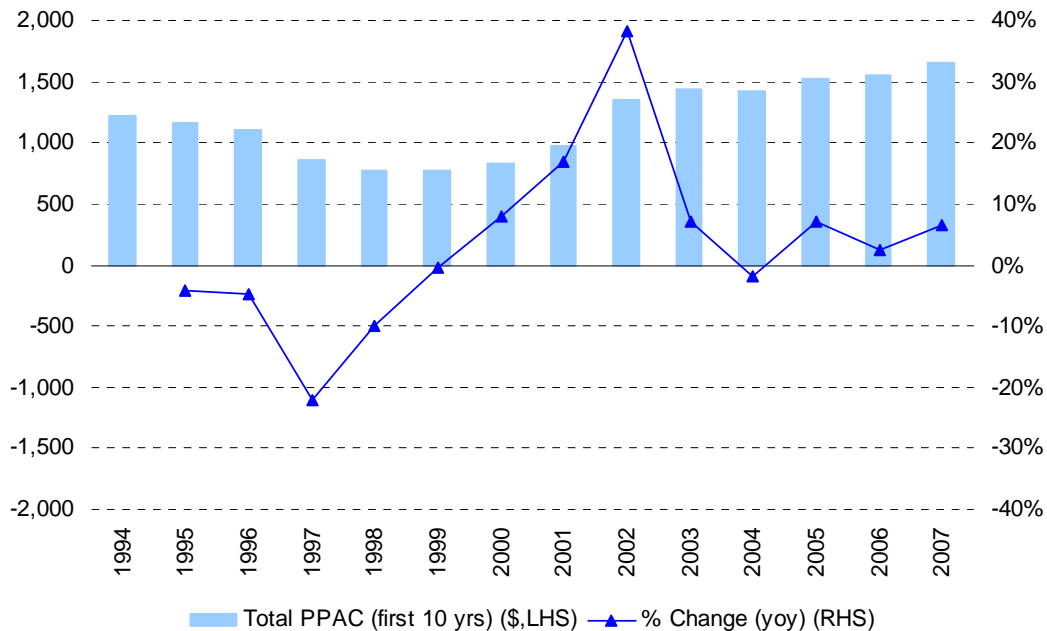
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The average quarterly PPAC for social rehab non-serious stabilises at around \$1,500 quite quickly after accident. The selected amounts appear reasonable.

### Superimposed Inflation

Figure C.7 below shows the average inflation-adjusted quarterly PPAC within a financial year for payments made in the first 10 years after accident, across all accounts.

**Figure C.7 - PPACs by payment year (first 10 years), all accounts**



If we measure superimposed as being the increase in the PPACs above, then superimposed inflation was:

- 3% p.a. over full period 1995 to 2007
- 5% p.a. in the last five years.

There is some evidence of superimposed inflation present in the experience for social rehab – non serious injuries. PwC select rates of 8.0% p.a. for 2008 and 4.0% for 2009 for capital but the report is not clear on the assumed non-capital rates. Given the similarity in cost drivers in the long term between this payment type and the equivalent but for seriously injured claimants, we would expect the long term superimposed inflation assumption to be the same for both. PwC should provide further justification of their assumed rates relative to recent experience and relative to social rehab for serious injuries in the long term.

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#### **C.4 Conclusions**

PwC's projection of the outstanding claims liability for social rehab non serious as at 30 June 2008 is \$929 million, compared with the projection from 30 June 2007 of \$926 million (ignoring changes in economic assumptions).

Based on our review we conclude that the methodology, assumptions and liability estimate for this payment type are reasonable.

#### **C.5 Recommendations**

Greater disclosure of the justification of superimposed inflation assumptions.

## D Non Fatal Weekly Benefits

Non fatal weekly benefits comprises income replacement payments made to claimants.

The projected 30 June 2008 outstanding claims liability projected from 31 December 2007 for non fatal weekly benefits is \$4,732 million. The following table shows this 30 June 2008 liability compared with the same estimate projected from 30 June 2007, noting that changes in economic assumptions are excluded from the comparison.

Account	Experience		Projected at 31/12/07	% change	Proportion of Liability
	Projected at 30/6/07	& model changes			
Employers			616		13%
Residual Work			655		14%
Partnership Program			70		1%
Self Employed			132		3%
<b>Total WC</b>			<b>1,473</b>		<b>31%</b>
Earners			1,214		26%
Residual Non Work			405		9%
<b>Total Earners</b>			<b>1,619</b>		<b>34%</b>
Treatment Injury			207		4%
Motor Vehicle			1,196		25%
Non Earners			237		5%
<b>Total</b>	<b>4,713</b>	<b>19</b>	<b>4,732</b>	<b>0.4%</b>	<b>100%</b>

<sup>1</sup> after allowance for changes in economic assumptions

Across all accounts, the current estimate of the liability at 30 June 2008 is only 0.4% different from that projected at 30 June 2007. From the information presented we are unable to show the projected liability from the 30 June 2007 valuation by payment type on the current economic assumptions.

The largest accounts are work accounts (31% of the liability), the earners accounts (34%) and the motor vehicle account (25%). Our examination has concentrated on the Employers, Residual Work, Earners and Motor Vehicle accounts.

### D.1 Experience in Six Months to 30 September 2007

The actual experience, in terms of both active claims in the September quarter and payments made, was close to the overall expected amount. There was some variation by account, as shown in Section 8.1 of the PwC report.

Payment experience over the period tended to be more favourable (compared to expected) for the older accident years (up to 1990).

Overall, there were no departures from the previous projections that were a cause for concern.

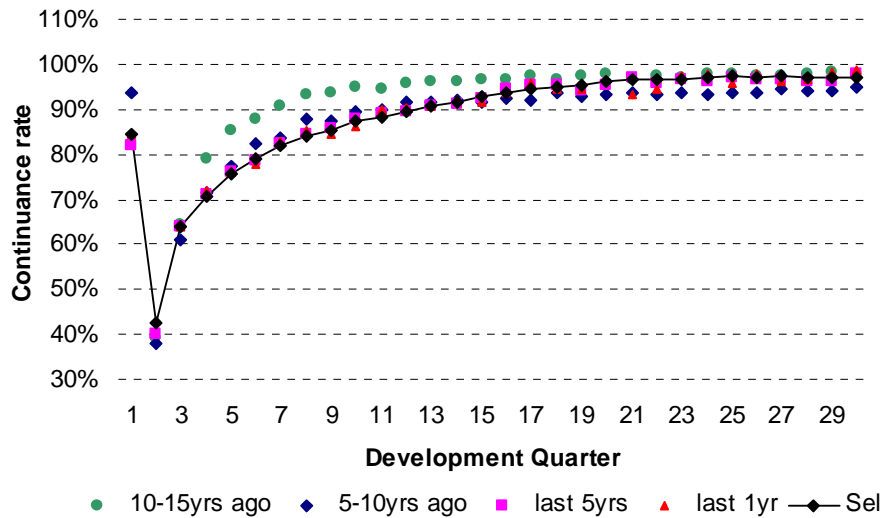
## D.2 Valuation Assumptions

### Continuance Rates

We have examined the continuance rate experience and compared it with PwC’s assumptions for the larger accounts where we have concentrated our review. While we may have selected some different individual assumptions, overall we are satisfied that the assumptions adopted are not unreasonable.

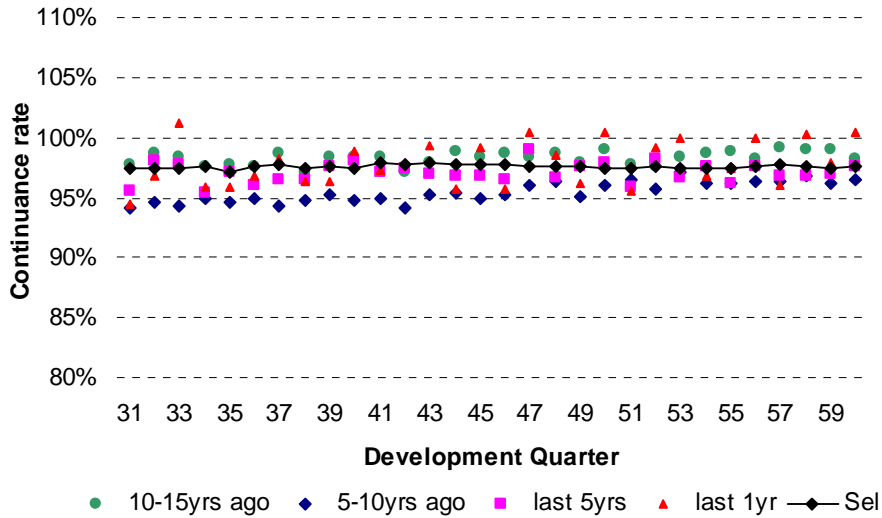
The following charts show the continuance rate experience and PwC’s assumptions for all accounts combined. For the experience, we have show the averages across the last year, the last five years, the five years before that (i.e. 5 to 10 years ago), and the five years before that (i.e. 10 to 15 years ago).

**Figure D.1 - Continuance Rates for All Accounts – Development Quarters 1 to 30**

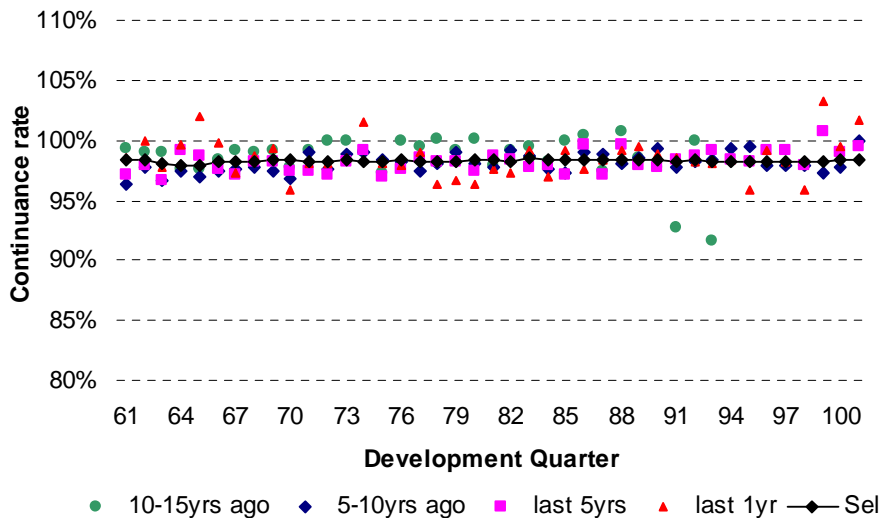


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**Figure D.2 - Continuance Rates for All Accounts – Development Quarters 31 to 60**



**Figure D.3 - Continuance Rates for All Accounts – Development Quarters 61 to 100**

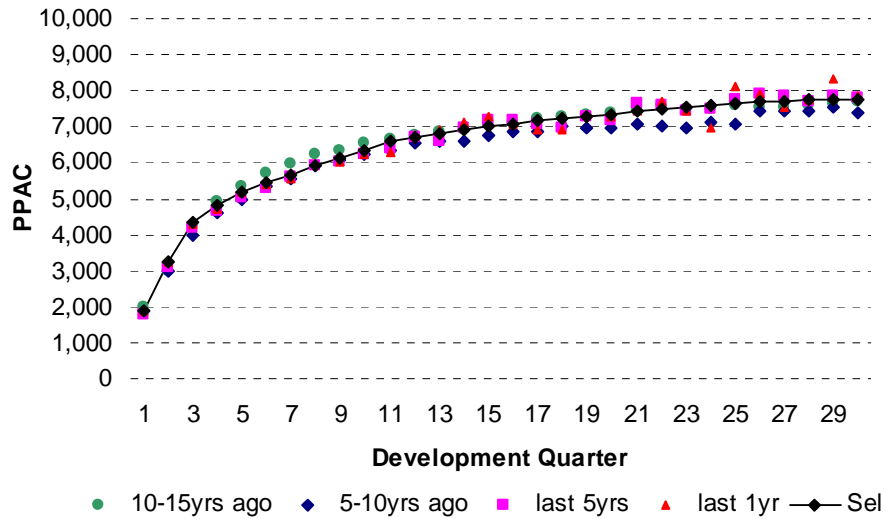


For early development periods (development quarters 4 to 20), there has been a marked shift in the continuance rate experience with the continuance rates now being much lower than they were 10 to 15 years ago. However for later development periods (development quarters 20 to 60), the continuance rates now are higher than they were 5 to 10 years ago. In the tail (development quarters 60+), the experience has been reasonably stable over the 15 years examined.

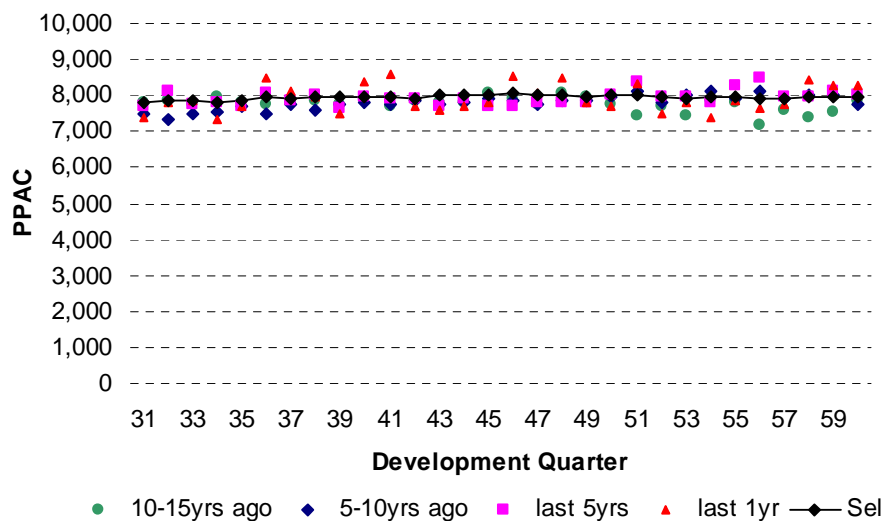
In our view, the PwC valuation assumptions fit the more recent experience reasonably well and are appropriate for valuation purposes.

The following charts show the PPAC experience and PwC's assumptions for all accounts combined.

**Figure D.4 - PPACs for All Accounts – Development Quarters 1 to 30**

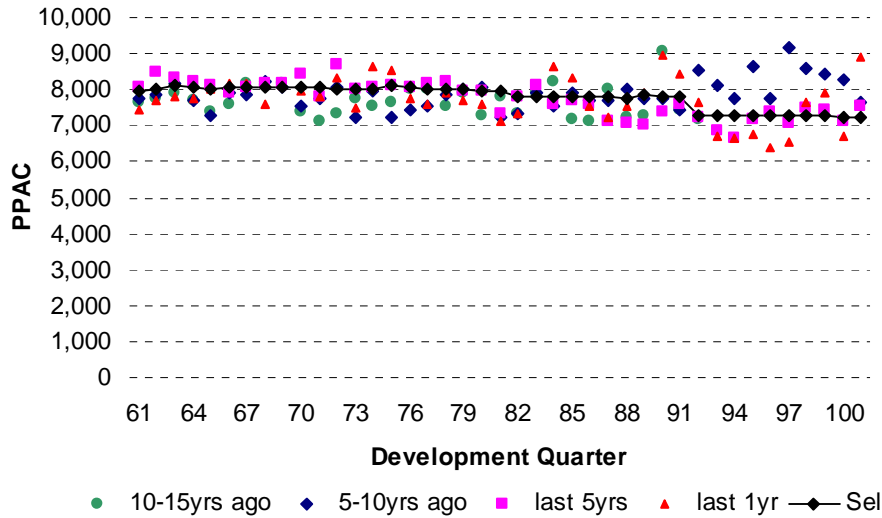


**Figure D.5 - PPACs for All Accounts – Development Quarters 31 to 60**



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Figure D.6 - PPACs for All Accounts – Development Quarters 61 to 100



As for the continuance rates, there was a marked drop in the PPACs at earlier development periods (i.e. development quarters 4 to 12) with the PPACs now being much lower than they were 10 to 15 years ago. However for later development periods (i.e. development quarters 14 to 40), the PPACs now are higher than they were 5 to 10 years ago.

In our view, the PwC valuation assumptions fit the more recent experience reasonably well and are appropriate for valuation purposes.

### PPACs in the Tail

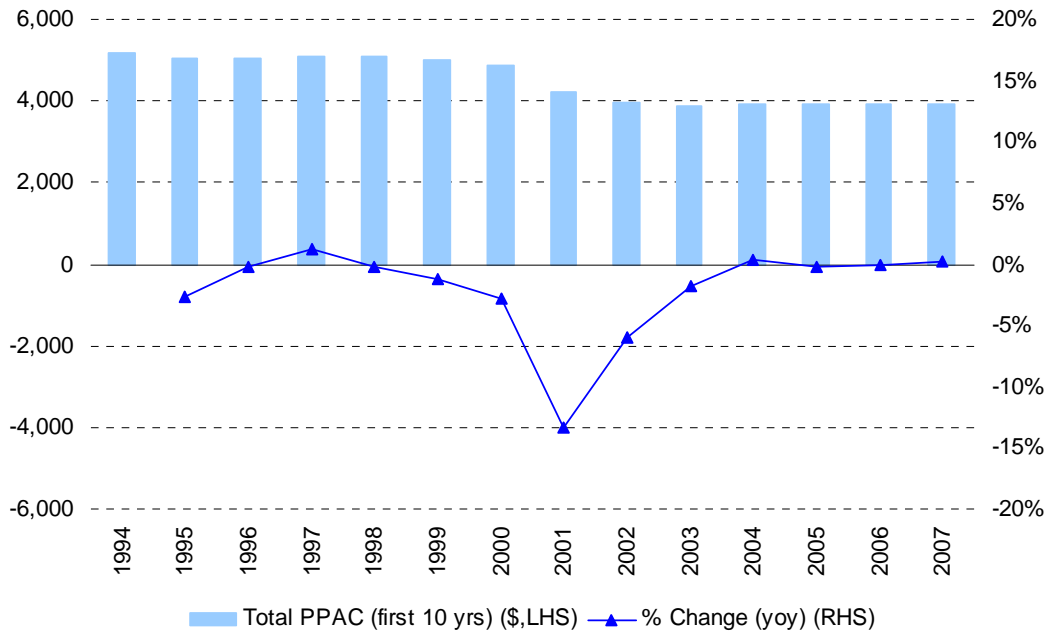
PwC assume that the PPACs reduce by 0.2% per quarter for each period beyond development quarter 130. There is no commentary in the PwC report supporting this assumption. We estimate that the impact of this assumption is to reduce the outstanding claims liabilities by around \$60 million to \$70 million. As such, we would like to see further justification for this assumption in PwC’s full valuation at 30 June 2008.

### Superimposed Inflation

There is no discussion of superimposed inflation within the non fatal weekly benefits section of PwC’s report. The following chart shows the sum across all accounts of the inflation-adjusted PPACs within financial years for the payments made in the first 10 years after accident.

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Figure D.7 - PPACs by payment year (first 10 years)



It is very clear from the above graph that there was a change in the level of non fatal weekly benefits in 2001, and that there has been no superimposed inflation in the benefit type. We suspect that the discontinuity in PPACs in some way relates to the privatisation period. We will investigate this further. Hence the adoption of 0% superimposed inflation for this payment type is appropriate. A comment to this effect in the PwC report would be useful.

### D.3 Other Issues

We understand that ACC have some key performance indicators (KPIs) for continuance rates at 3, 6 and 12 months duration. We have not sighted the KPIs nor do we understand how the measures are compiled. However we understand that the performance of the actual continuance rates relative to the KPIs has been poor. This is an area of further investigation that will be undertaken as part of our review of the June 2008 full valuation.

### D.4 Conclusions

PwC's projection of the outstanding claims liability for non fatal weekly benefits at 30 June 2008 is \$4,732 million, compared with the projection from 30 June 2007 of \$4,713 million.

We conclude that the methodology and assumptions are appropriate. Based on our review we conclude the liability for this benefit is not unreasonable.

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## D.5 Recommendations

Include justification for the reducing PPAC assumption beyond development quarter 130.

## E Fatal Weeklies

The payment type refers to weekly benefits payable to spouses and/or dependants following bereavement. Most of the recipients of dependant benefits are children, and so payments typically cease when the child becomes an adult. Spouse benefits for accidents after 31 March 1992 are payable for a maximum of 5 years. For accidents prior to 31 March 1992, spouse benefits are payable until the retirement date of the deceased. Certain claimants have the option of capitalising their benefits to receive a lump sum rather than weekly payments.

The projected 30 June 2008 outstanding claims liability projected from 31 December 2007 for Fatal Weeklies is \$412 million. The following table shows this 30 June 2008 liability taken from PwC's valuation:

**Table E.1 - 30 June 2008 Fatal Weeklies Liability from 31 December 2007 (\$m)**

Account	Total	%
Employers	30	7%
Residual Work	45	11%
Partnership Program	1	0%
Self Employed	9	2%
<b>Total Work</b>	<b>85</b>	<b>21%</b>
Earners	118	29%
Residual Non Work	36	9%
<b>Total Earners</b>	<b>154</b>	<b>37%</b>
Treatment Injury	8	2%
Motor Vehicle	165	40%
Non Earners	0	0%
<b>Total</b>	<b>412</b>	<b>100%</b>

The change in result due to claims experience and modelling (from section 2.2.1) was \$1 million, or 0%:

- The estimated liability for Fatal Weeklies is approximately 3% of the ACC total.
- Just under 70% of the estimated liability is in respect of the Motor and Earners accounts.

### E.1 Valuation Assumptions

#### Continuance Rates - Dependants

Figure E.1, Figure E.2 and Figure E.3, compare PwC's selected continuance rates for dependants with historical observations over a number of different periods.

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Figure E.1 - Continuance Rates for All Accounts – Development Quarters 1 to 30

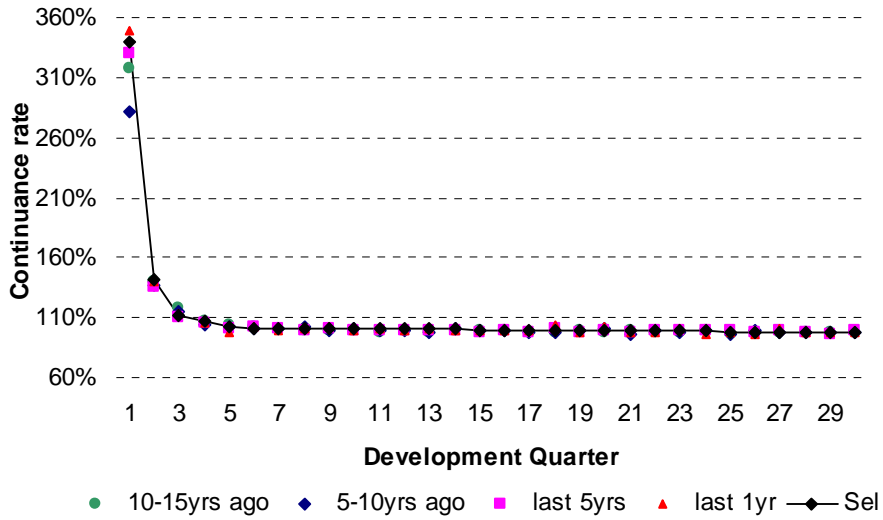
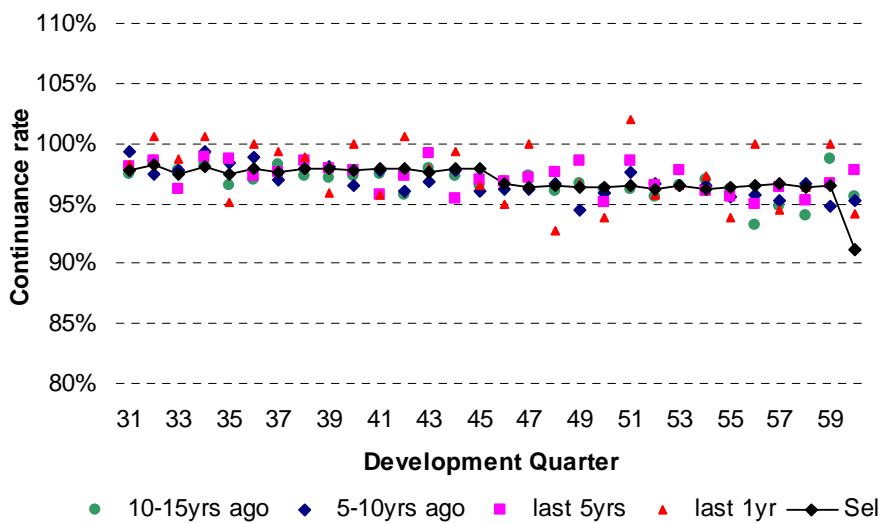
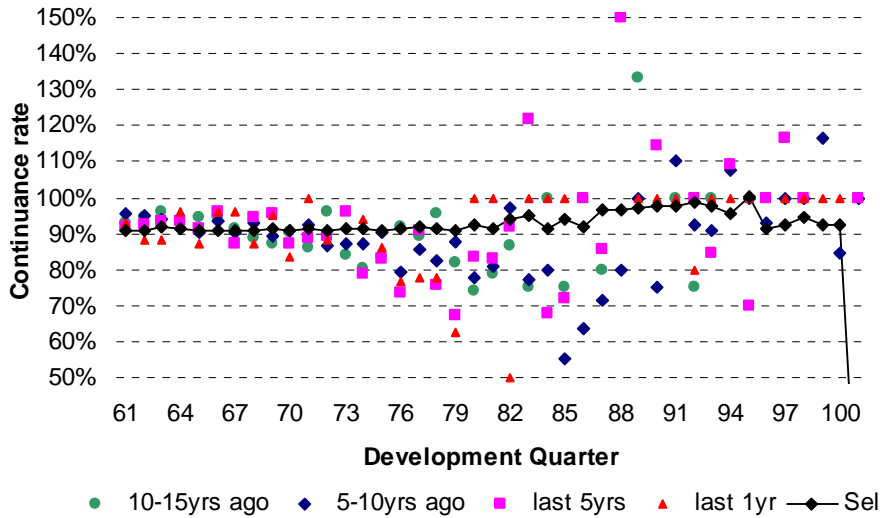


Figure E.2 - Continuance Rates for All Accounts – Development Quarters 31 to 60



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**Figure E.3 - Continuance Rates for All Accounts – Development Quarters 61 to 100**



We make the following observations:

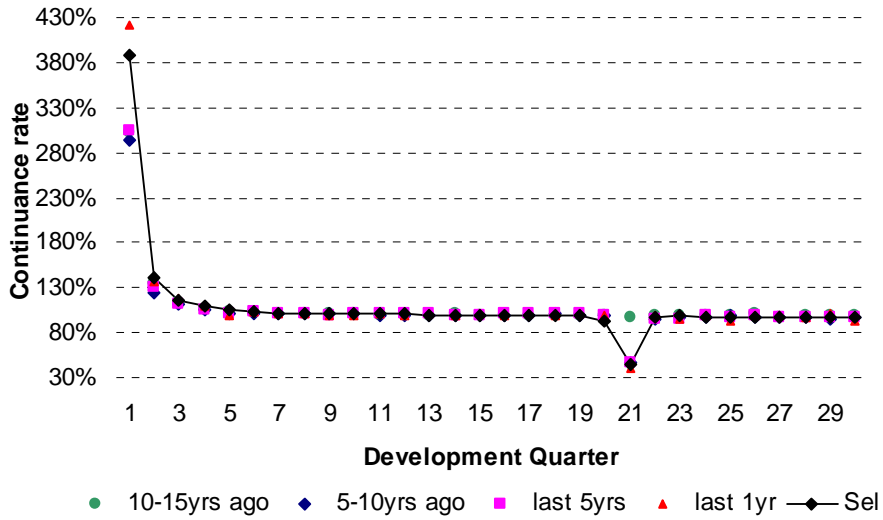
- Although there is some uncertainty about continuance rates in the first couple of quarters, between quarters 3 and 30 continuance rates have consistently been approximately 100%. PwC’s selections reflect this feature of the experience.
- There is more variation between the averages over different periods between quarters 31 and 60. We note that the one year average continuance rates vary considerably from quarter to quarter, which is likely attributable to random variation. As is appropriate, PwC has selected a smoother continuance curve with more closely reflects the longer term averages.
- There is considerable variation in the experience beyond development quarter 60. This reflects the relatively small number of claimants continuing to receive payments at these durations. PwC’s assumed continuance rate of just over 90% in quarters 61-80 reflects a smoothed average of this experience. PwC’s selections beyond this point are volatile as there are so few individuals claiming.

### Continuance Rates – Spouses

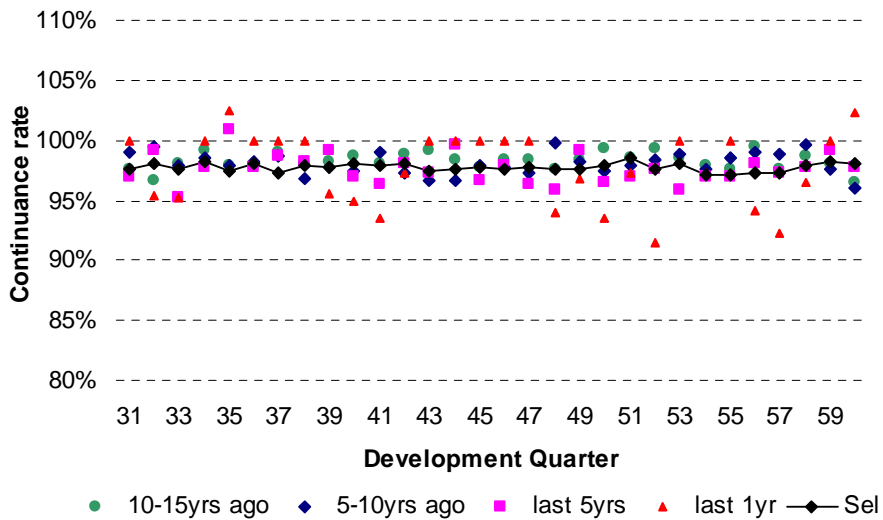
The following charts compare PwC’s selected continuance rates for spouses with historical observations over a number of different periods.

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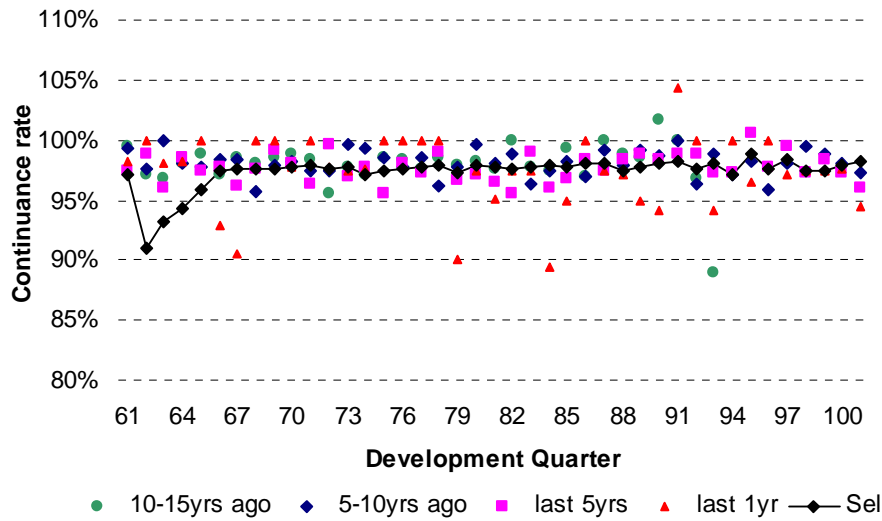
**Figure E.4 - Continuance Rates for All Accounts – Development Quarters 1 to 30**



**Figure E.5 - Continuance Rates for All Accounts – Development Quarters 31 to 60**



**Figure E.6 - Continuance Rates for All Accounts – Development Quarters 61 to 100**



We make the following observations:

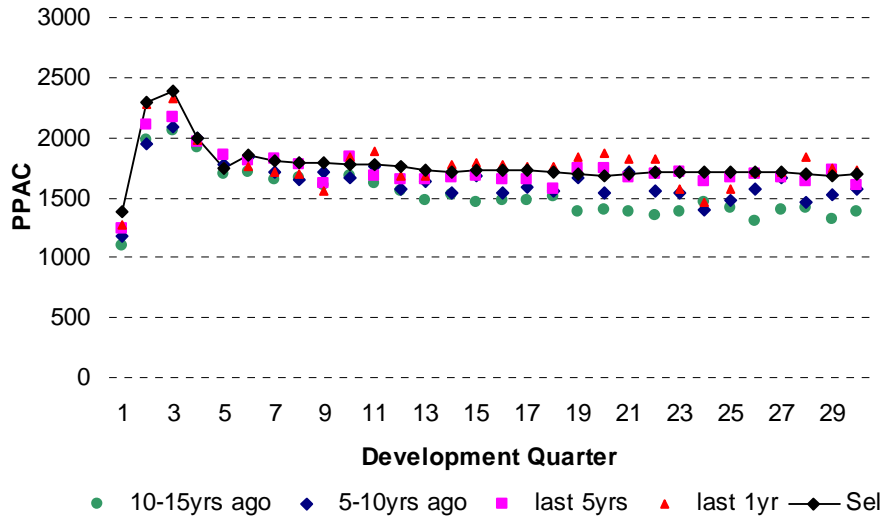
- Although there is some uncertainty about continuance rates in the first couple of quarters, between quarters 3 and 20 continuance rates have consistently been approximately 100%. The low rate of continuance at quarter 20 reflects the 1992 legislation change. PwC’s selections reflect this feature of the experience.
- Beyond quarter 20 the experience is more variable. The charts do not indicate an increasing or decreasing trend in continuance rates. PwC’s assumptions are generally in line with the historical experience. The variation in assumptions around quarter 62 arises because of the small number of claimants being projected.

The PwC report notes that continuance rates for spouses between 20 and 60 quarters decreased over the period 1996 to 2007, although there has been some variation in the downward trend over time. PwC has estimated that the continuance rate will reduce further by 2010, although the amount of the reduction assumed is small. The anticipated reduction is attributed to the change in entitlement to payments introduced in 1992. We note that this change was introduced almost 15 years ago (60 quarters). Therefore it is not clear how the change introduced in 1992 can continue to have an affect on continuance rates.

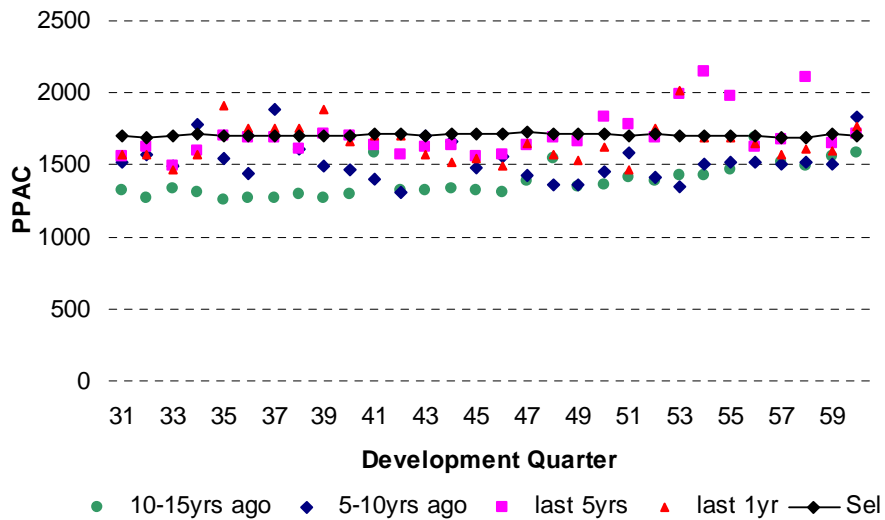
**PPACs – Dependants**

Figure E.7, Figure E.8 and Figure E.9 compare historical PPACs to PwC’s selections.

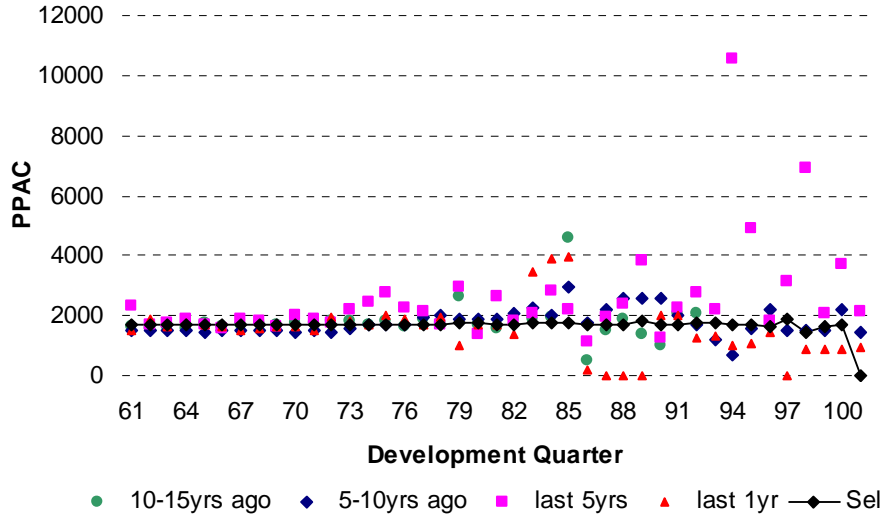
**Figure E.7 - PPACs for delay quarters 1-30, all accounts**



**Figure E.8 - PPACs for delay quarters 31-60, all accounts**



**Figure E.9 - PPACs for delay quarters 61 and later, all accounts**



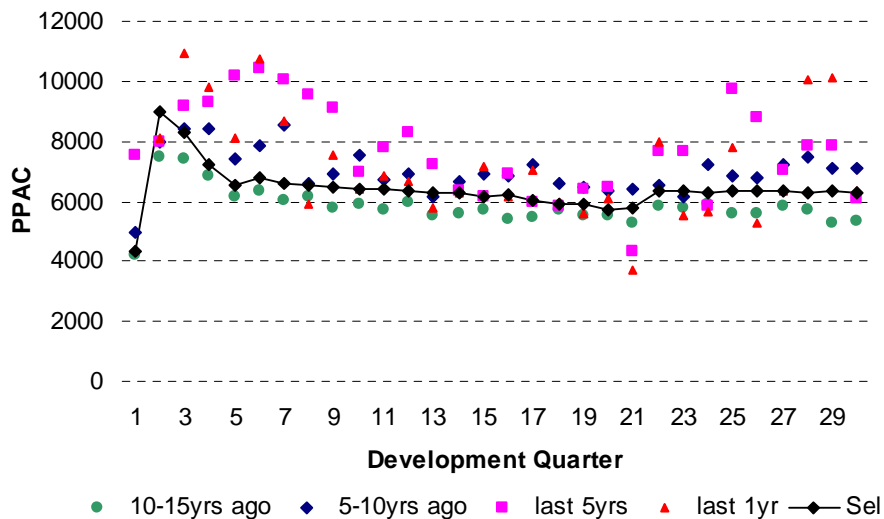
Up to development quarter 70 there is evidence of PPACs increasing over time so that, for example, the average over the last 5 years is typically higher than the averages for earlier periods. Beyond quarter 70 the experience is more volatile, which is likely due to the small number of claimants at these durations.

Up to development quarter 60, PwC’s selected assumptions are typically around the same level as the average experience of the last 5 years. For later development quarters the PwC selections appear to be based on experience over a longer period. These assumptions are not unreasonable.

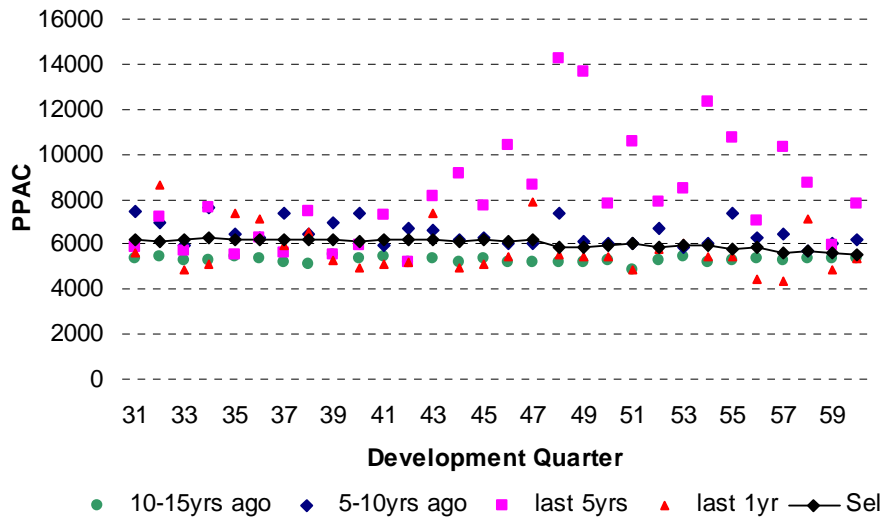
**PPACs – Spouses**

Figure E.10, Figure E.11 and Figure E.12 compare historical PPACs to PwC’s selections.

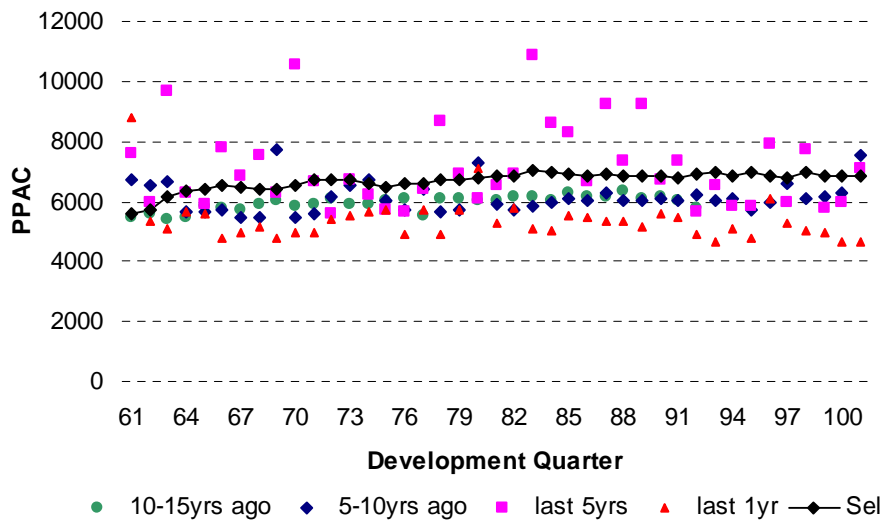
**Figure E.10 - PPACs for delay quarters 1-30, all accounts**



**Figure E.11 - PPACs for delay quarters 31-60, all accounts**



**Figure E.12 - PPACs for delay quarters 60 and later, all accounts**



Experience in the last 5 years has been volatile for this payment type, with high PPACs being observed in some periods. Historical payments may have been distorted by capitalisations. This makes selection of future assumptions more difficult. Table E.2 shows the average PPACs implied by the above chart. This shows that for development quarters 1-30, the selected PPACs are typically lower than the recent experience. For quarters 31 and beyond, the selected PPACs are between the average for the last 1 year and the last 5 years.

**Table E.2 – Comparison of Average PPACs**

Period	Quarters 1-30	Quarters 31-60	Quarters 61 and Later
10-15yrs ago	5,829	5,289	5,943
5-10yrs ago	7,007	6,499	6,097
Last 5yrs	7,686	8,158	7,267
Last 1yr	7,100	5,745	5,457
Selected	6,405	6,017	6,616

The assumptions for quarters 1-30 appear low relative to the recent experience. However, the difference is unlikely to be significant in the context of ACC’s total liability due to the small size of liabilities for this payment type.

### Superimposed Inflation

There is no allowance for superimposed inflation. Claims are inflated in line with labour cost inflation (LCI).

## E.2 Uncertainty

There is limited commentary on uncertainty for this payment type. This likely reflects the relatively small size of the liabilities compared to other payment types. It is uncertain whether the assumed reductions in continuance rates will be realised although, as noted above, this uncertainty is not material when compared to ACC’s total liabilities. Although the selected PPAC assumptions appear low relative to five year historical averages, the effect of selecting a higher PPAC assumption would not be material in the context of ACC’s total estimated liability.

## E.3 Conclusions

We conclude that the methodology and assumptions are appropriate and not unreasonable.

Based on our review we conclude the liability for this benefit is not unreasonable.

## E.4 Recommendations

None.

## F Independence Allowance

Independence Allowance is a weekly benefit paid to individuals with permanent impairment arising from personal injury. The level of payments depends on the extent of the impairment, with the maximum benefit only payable to individuals with more than 80% impairment.

The Independence Allowance is only available for accident dates prior to 1 April 2002. Lump Sums benefits were introduced for accidents on or after 1 April 2002. However, PwC has observed that claims continue to be received for accidents after 2002. PwC was advised that these are generally due to gradual process claims, where the date of injury is difficult to determine.

The majority of claims reported after 2002 are categorised by ACC as “sensitive claims”, that is, not relating to claims in respect of asbestos related disease or hearing loss.

Claimants typically receive Independence Allowance until death. Recipients also have the option to capitalise their payment and receive a lump sum covering payments for a period of five years. After this time, claimants have the option to receive a further lump sum or return to weekly payments.

### F.1 Results

The projected 30 June 2008 outstanding claims liability projected from 31 December 2007 for Independence Allowance is \$630 million. The following table shows this 30 June 2008 liability taken from PwC’s valuation:

**Table F.1 - 30 June 2008 Independence Allowance Liability from 31 December 2007 (\$m)**

Account	Total	%
Employers	11	2%
Residual Work	59	9%
Partnership Program	1	0%
Self Employed	3	0%
<b>Total Work</b>	<b>73</b>	<b>12%</b>
Earners	104	17%
Residual Non Work	16	3%
<b>Total Earners</b>	<b>120</b>	<b>19%</b>
Treatment Injury	31	5%
Motor Vehicle	89	14%
<b>Non Earners</b>	<b>317</b>	<b>50%</b>
<b>Total</b>	<b>630</b>	<b>100%</b>

The change in results due to claims experience and modelling (from section 2.2.1) was \$4 million, or 1%:

- The estimated liability for Independence Allowance is approximately 4% of the total for ACC.
- Over half of the estimated liability is in respect of the Non Earners account.

## F.2 Valuation Assumptions

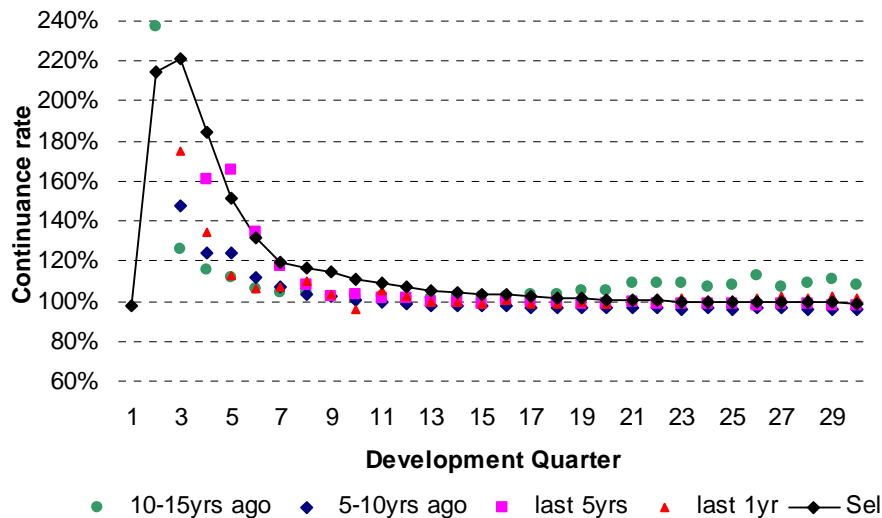
### Continuance Rates

Claimants typically receive Independence Allowance until death, and so continuance rates for existing claimants are largely based on mortality assumptions. PwC used data on age and gender to allow for mortality at individual claimant level. The mortality assumptions assume a rate of 150% of standard population mortality, on the basis that claimants health will be poor relative to the population as a whole. There is also a loading for additional discontinuance applied to some on the claimants based on rates observed in the data. Very limited data is available on the mortality of impaired lives, so it is difficult to verify the appropriateness of the loading applied by PwC. However, we believe that this is a standard actuarial approach.

Recipients of Independence Allowance have the option to capitalise their payment and receive a lump sum covering five years of benefits. PwC assume that a proportion of claimants will choose to capitalise in each quarter, and adjusts its calculations accordingly.

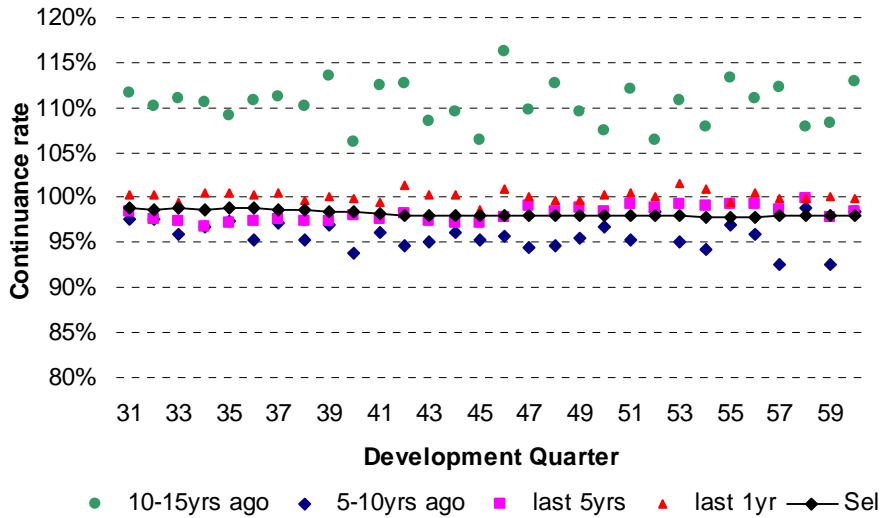
Figure F.1, Figure E.2 and Figure F.3 compare PwC's selected continuance rates to actual continuance rates over various periods.

**Figure F.1 - Continuance Rates for All Accounts – Development Quarters 1 to 30**

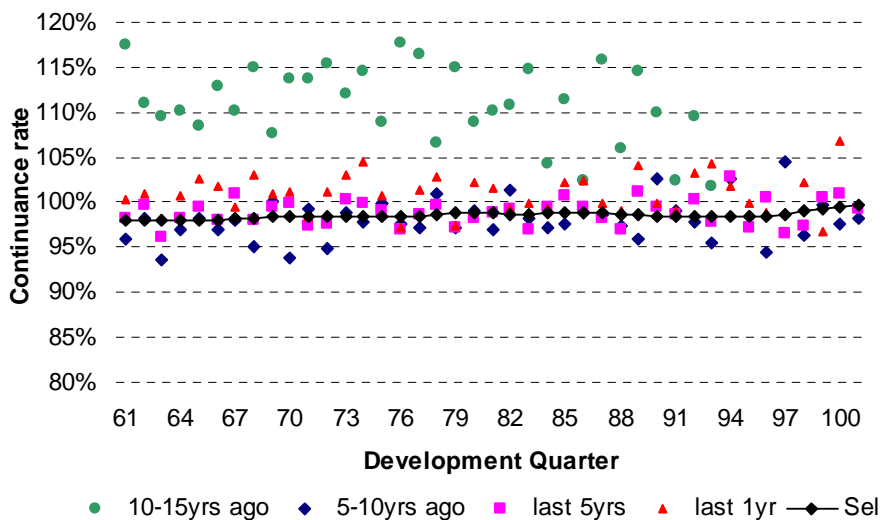


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**Figure F.2 - Continuance Rates for All Accounts – Development Quarters 31 to 60**



**Figure F.3 - Continuance Rates for All Accounts – Development Quarters 61 to 100**



The charts indicate the following:

- At most development quarters, the recent continuance rates (5 year and 1 year averages) are higher than the rates observed 5-10 years ago. However, the recent continuance rates are typically lower than were observed 10-15 years ago.
- Historical experience has been volatile in the initial development quarters. PwC appear to have taken a conservative approach here, because their selected continuance rates in the first 20 quarters are typically above the historical averages.
- From development quarter 25 onwards, the selected rates are broadly in line with the average experience of the last 5 years (although there are some periods where

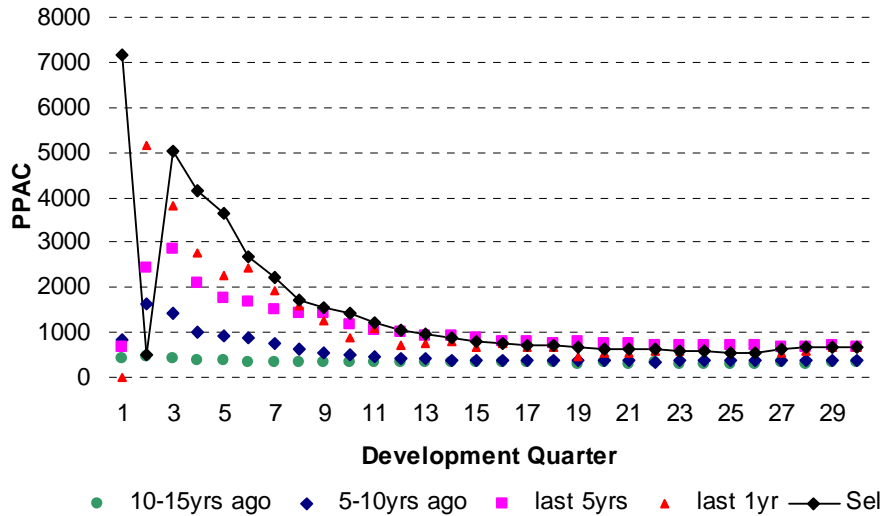
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the selections are consistently higher or lower for a number of quarters). The selected continuance rates are typically lower than those observed in the last year.

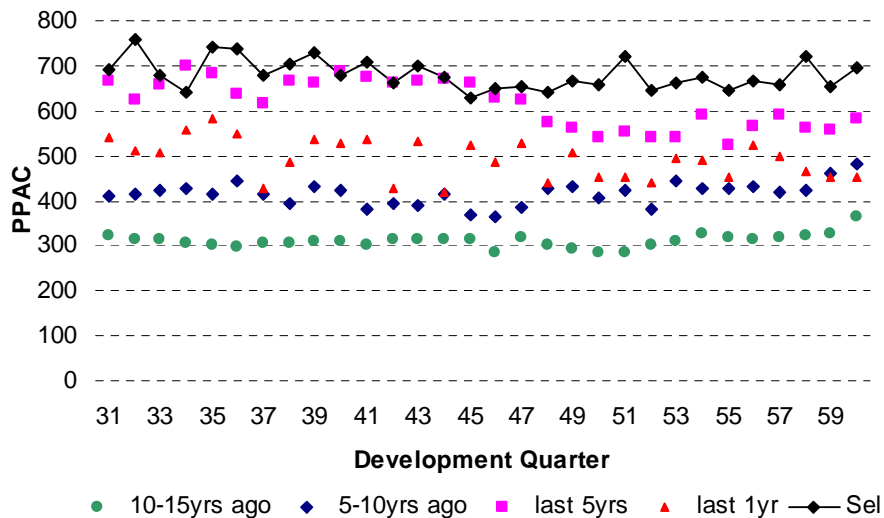
### PPACs

The charts below show historical PPACs by development quarter over a number of years.

**Figure F.4 - PPACs for delay quarters 1-30, all accounts**

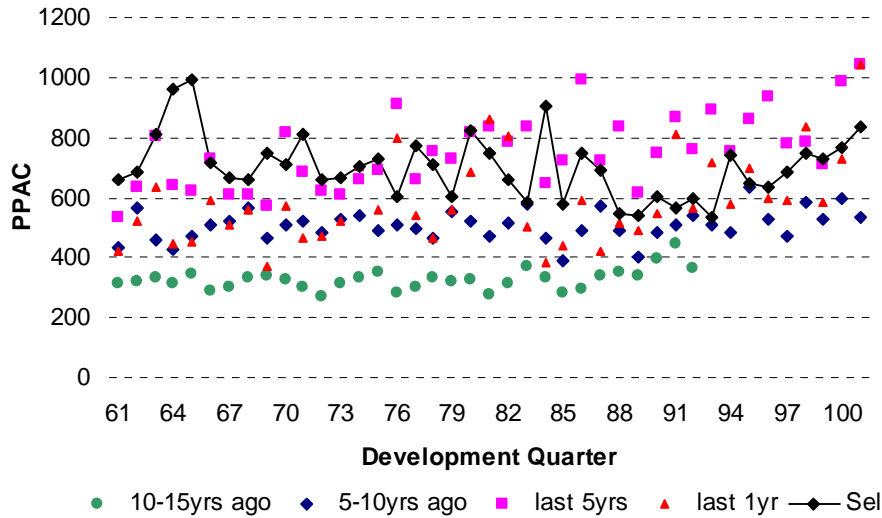


**Figure F.5 - PPACs for delay quarters 31-60, all accounts**



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Figure F.6 - PPACs for delay quarters 61 and later, all accounts



We note that PPACs have tended to increase over time at all durations. For example, the averages from the last 5 years are typically higher than for 5-10 years ago, which are in turn higher than the averages of 10-15 years ago. However, with the exception of the first 8 development quarters, the PPAC's over the last year have been lower than over the previous 5 years.

As noted above, the 5 year average PPACs are typically the highest of the different averages considered. For most development quarters, PwC's selections are either at a similar level to the 5 year average, or at a higher level than the 5 year average. For accident quarters beyond 80 the experience is volatile and so the selections appear to consider averages over periods longer than 5 years.

### Superimposed Inflation

PwC previously included a one-off 6.8% superimposed inflation allowance in respect of the *Fenemor* ruling. This ruling increased the level of Independence Allowance payable to claimants that had previously received a lump sum benefit. On the assumption that part of the increase in claims will now be reflected in the payment data, the superimposed inflation allowance has reduced to 3.5%.

The 6.8% inflation was intended to increase estimated liabilities by \$40 million for the *Fenemor* ruling. The \$40 million estimate was provided by the ACC. It is not clear from the report what analysis has been undertaken by PwC to verify that the original estimate of \$40 million was appropriate, or in determining the level of reduction in the provision. It would be useful for ACC to separately identify claimants affected by changes in legislation so such matters could be independently investigated. However, this issue does not appear to be material in the context of the total estimated liability for this payment type.

### **F.3 Uncertainty**

There is limited commentary on uncertainty for this payment type. This likely reflects the relatively small size of the liabilities compared to other payment types.

Claim number projections are uncertain given the historical changes for this payment type. In Section 26 of the report, PwC estimates that a 20% increase in IBNR claims for this payment type would increase the central estimate by \$16 million, with the discounted increase being minimal due to the long term nature of the payments. This amount is small in the context of ACC's total liabilities.

Uncertainty relating to claim payments is reduced because it is assumed that benefits will be payable until death. However, there is clearly uncertainty relating to when the claimants will die, and the relative mortality of claimants compared to the New Zealand population as a whole.

### **F.4 Conclusions**

We conclude that the methodology and assumptions are appropriate. The report does not describe any analysis undertaken by PwC relating to the Fenemor ruling, although this issue is not material in the context of the total liabilities for this payment type.

Based on our review we conclude the liability for this benefit is not unreasonable.

### **F.5 Recommendations**

We understand that there is some uncertainty regarding whether these liabilities should be assessed on a claims made basis. We recommend that this issue is resolved. The issue involves interpretation of the legislation governing the ACC, and detailed knowledge of accounting matters relevant to the claims.

## G Lump Sums – Excluding Asbestos

Individuals experiencing permanent impairment arising from personal injury are eligible to claim a lump sum. The amount of the lump sum depends on the extent of the impairment. Lump sums are payable for accidents occurring on or after 1 April 2002. Before this period claimants were entitled to apply for the Independence Allowance.

Assessments for lump sum payments begin once the injury has stabilised or within two years of injury, whichever is sooner. Therefore IBNR claims can arise from both reporting and assessment delays.

Gradual process claimants, for example, work related gradual process hearing loss claimants, may be eligible for lump sum payments. Asbestos related disease claims are reviewed separately.

We understand from PwC that the liability estimates do not include an allowance for gradual process claims with accident dates after 30 June 2008. For example, the estimated liability does not include amounts in respect of individuals presenting with hearing loss in 2010 as a result of exposure to workplace noise in 2000.

### G.1 Results

The projected 30 June 2008 outstanding claims liability projected from 31 December 2007 for Lump Sums is \$313 million. Note that this figure includes the asbestos lump sums of approximately \$41 million. We do not have a split of lump sums by account separately for asbestos and non-asbestos claims. The following table shows this 30 June 2008 liability taken from PwC's valuation.

**Table G.1 - 30 June 2008 Lump Sum Liability from 31 December 2007 (\$m)**

Account	Total	%
Employers	43	14%
Residual Work	48	15%
Partnership Program	4	1%
Self Employed	9	3%
<b>Total Work</b>	<b>104</b>	<b>33%</b>
Earners	51	16%
Residual Non Work	0	0%
<b>Total Earners</b>	<b>51</b>	<b>16%</b>
Treatment Injury	26	8%
Motor Vehicle	60	19%
Non Earners	71	23%
<b>Total</b>	<b>313</b>	<b>100%</b>

Change in result due to claims experience and modelling (from section 2.2.1) was \$26 million, or 8%. However, the individual sections of the report note that the effect of changes in assumptions and methods for non-asbestos claims has been almost nil.

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- The estimated liability for Lump Sums (including asbestos) is approximately 2% of the total.
- The liabilities are spread over a number of accounts. The largest proportion of the liability (23%) is allocated to the Non Earners account.

## G.2 Valuation Assumptions

### Superimposed Inflation

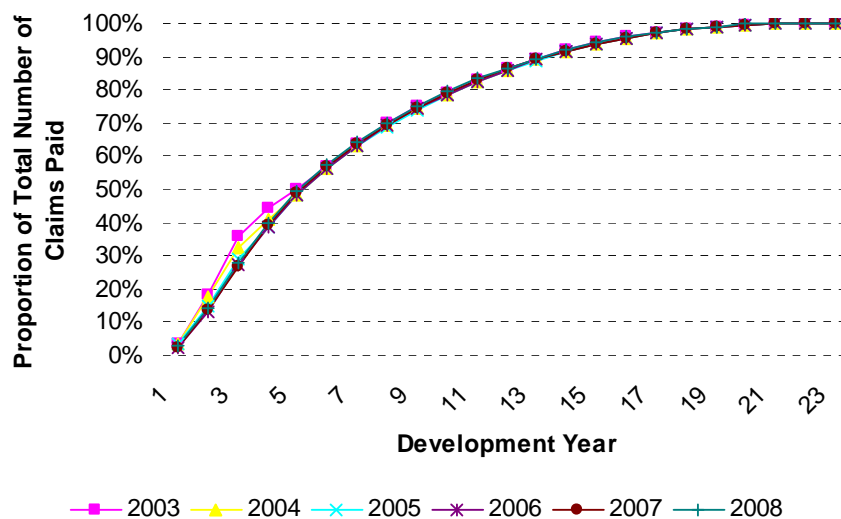
There is no allowance for superimposed inflation. Claims are inflated in line with consumer price inflation.

### Future Claim Numbers

PwC previously assumed that all claims would be reported and paid within 20 years of accident. This period has now been extended to 25 years. However, they have reduced their estimated number of future claims, because claims have been more favourable than anticipated in the past. The discounted mean term of the liabilities has increased from 3.6 years to 5.2 years.

Figure G.1 below shows the claim payment patterns implied by PwC's projections, considering all accounts combined. For each development period the graphs express the number of claims paid to date as a percentage of the total expected number of claims for the accident year. Actual numbers of claims are used for historical development periods, and estimated numbers used for future periods.

**Figure G.1 - Lump Sum (ex asbestos) Payment Pattern**



PwC has assumed that just under 15% of claims will have been paid within 2 years of the accident date, and approximately 50% of claims will have been paid after 5 years.

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## Average Claim Size

The average claim size in 2007 was higher than anticipated, and exceeded PwC's previous estimate by 12%. No reason is identified for the increase in average claim size. However, it is noted that total payments in the same period were less than expected, so the increase in average claim size may arise from an exceptional change in the mix of claims.

PwC has increased the future average claim size assumptions in response to the emerging experience. However, as shown on chart 21.2.2, the average claim size expected in the period 2008-2010 is less than was experienced in 2007. This is not unreasonable, depending on the cause of the increase in 2007. If average claim sizes continue to exceed expectations then a greater increase in assumptions would probably be required.

### **G.3 Uncertainty**

There is limited commentary on uncertainty for this payment type. This likely reflects the relatively small size of the liabilities compared to other payment types. We note that the effect of any change in assumptions for this payment type is unlikely to be significant in the context of the total liabilities of ACC.

There is more than the usual amount of uncertainty relating to the future claim number assumptions. This is because these assumptions relate to claims being reported in many years to come, potentially from types of disease that have not yet been identified. An additional source of uncertainty is that historical development data for this payment type is limited, since the benefit was only introduced in 2002.

Assumptions regarding the lump sum amount are more certain since the level of benefits payable are specified. Average cost could exceed the amount indicated if the severity of reported injuries increases, resulting in a higher lump sum. The timing of reports would also impact on the size of the lump sum in absolute terms.

### **G.4 Conclusions**

Because historical data for this payment type is limited, there is more than the usual level of uncertainty regarding the development assumptions. In addition, the limited data means that a wider range of assumptions might be considered reasonable than would normally be the case. Based on our experience of similar schemes, together with our review of the limited historical data, we believe that the assumptions are appropriate.

Based on our review we conclude the liability for this benefit is not unreasonable.

### **G.5 Recommendations**

As discussed in the Executive Summary, we note that there is some uncertainty regarding the correct accounting basis for gradual process claims. We recommend that this basis be clarified.

## H Lump Sums – Asbestos

The New Zealand Court of Appeal ruling in 2006 (Estate of Priddle and Others vs ACC) ruled that individuals with asbestos related disease were entitled to claim a lump sum rather than impairment allowance. Typically it is only possible to claim a lump sum payment for events occurring on or after 1 April 2002. Asbestos related claims that are currently being report will arise from exposure long before 2002.

PwC considers asbestos lump sums separately from other lump sum payments. Separate analysis is appropriate given that the claims are likely to have different characteristics.

As with the other lump sums, we understand from PwC that the liability estimates do not include an allowance for claims with accident dates after 30 June 2008. For example, the estimated liability does not include amounts in respect of individuals presenting with mesothelioma or other asbestos related diseases in the future, unless the date of incapacity was prior to 30 June 2008. We understand from PwC that asbestos lump sum claims must be lodged prior to the death of the injured individual. The time between death and diagnosis for mesothelioma is typically less than a year, which further limits the scope for IBNR claims.

We note that the chart in Section 22.2.1 of the PwC report shows estimated claims for accident periods 2009-2015. PwC has advised that these are included for illustrative purposes, and are not included in the liability estimate.

The projected 30 June 2008 outstanding claims liability projected from 31 December 2007 for Lump Sums is \$313 million, of which asbestos lump sums of approximately \$41 million. We do not have a split of lump sums by account separately for asbestos and non-asbestos claims. This is reported to be an increase of \$17 million compared to PwC's previous report. The increase arises because payments were less than was anticipated, and this was interpreted as being largely a timing issue. It is also possible that payments were lower than expected because the estimated liability was overstated. We note that both the current estimate and the change in the estimate represent a very small proportion of ACC's total estimated liabilities.

For this valuation, PwC has assumed that all claims will be allocated to the Residual Work account.

### H.1 Valuation Assumptions

#### Superimposed Inflation

There is no allowance for superimposed inflation. Claims are inflated in line with consumer price inflation.

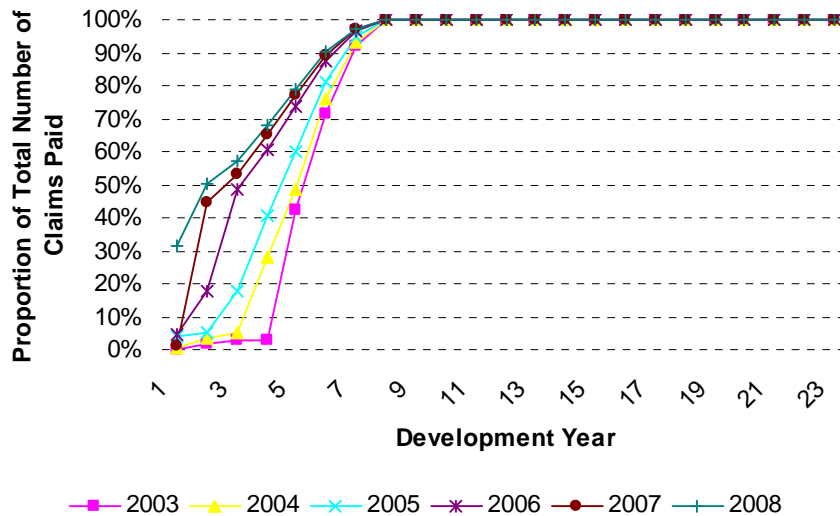
#### Future Claim Numbers

Figure H.1 below shows the claim payment patterns implied by PwC's projections, considering all accounts combined. For each development period the graphs express the

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number of claims paid to date as a percentage of the total expected number of claims for the accident year. Actual numbers of claims are used for historical development periods, and estimated numbers used for future periods.

**Figure H.1 - Lump Sum (asbestos) Payment Pattern**



As expected, the parts of the curves corresponding to actual paid claims vary significantly from year to year, and show significant jumps that coincide with the Priddle ruling. For the 2008 and subsequent years, PwC assume that approximately one third of claims will be paid in the first year, and all claims will be paid after 8 years.

The report does not describe the methodology used by PwC to produce the curves.

The basis of estimation means that delays between a loss having been considered as occurring and payment being made arise due to:

- Delay in claimant reporting to ACC (the claimant already been made aware of the disease following medical diagnosis).
- Time taken for ACC to assess eligibility following receipt of a claim.
- Time taken for ACC to make the assessed payments.

We therefore conclude that PwC’s selected pattern does not appear unreasonable. However, we would expect that PwC continue to monitor this pattern as the effects of the legislative changes become clearer.

### Average Claim Size

The average claim size is reported to be largely unchanged from the previous review.

## **H.2      Uncertainty**

PwC notes that there was uncertainty regarding claim numbers following the Priddle ruling. We consider that considerable uncertainty still remains since a relatively short time has elapsed since the ruling. The uncertainty is reduced because of the limited scope of asbestos related diseases included in the liability estimate, that is, only claims made prior to 30 June 2008, and only in respect of living claimants.

In Section 26, PwC estimates that a 20% change in asbestos IBNR would change the central estimate by \$7 million before discounting, \$2 million after discounting. This uncertainty is not material in the context of ACC's total estimated liabilities. An estimate of the total liabilities of ACC in respect of all future asbestos claimants would be subject to greater uncertainty, and would potentially be significant in the context of ACC's total liabilities.

## **H.3      Conclusions**

Based on our review we conclude the liability for this benefit is not unreasonable.

## **H.4      Recommendations**

As discussed in the Executive Summary, we note that there is some uncertainty regarding the correct accounting basis for gradual process claims. We recommend that this basis be clarified.

## I Vocational Rehabilitation

### I.1 Result

The projected 30 June 2008 outstanding claims liability projected from 31 December 2007 data for vocational rehab benefits is \$148 million. The following table shows this liability as at 30 June 2008 compared with the same estimate projected from 30 June 2007 data, noting that changes in economic assumptions are excluded from the comparison.

**Table I.1 - Vocational Rehab Benefits - 30 June 2008 (\$m)<sup>1</sup>**

Account	Experience		Projected at 31/12/07	% change	Proportion of Liability
	Projected at 30/6/07	& model changes			
Employers			26		17%
Residual Work			12		8%
Partnership Program			1		1%
Self Employed			5		3%
Total WC			44		29%
Earners			46		31%
Residual Non Work			6		4%
Total Earners			51		35%
Treatment Injury			3		2%
Motor Vehicle			36		24%
Non Earners			15		10%
Total	147	1	148	0.7%	100%

<sup>1</sup> after allowance for changes in economic assumptions

Across all accounts, the current estimate of the liability as at 30 June 2008 is only 0.7% higher from that projected as at 30 June 2007. From the information presented we are unable to show the projected liability as at 30 June 2008 from the 30 June 2007 valuation by account on the current economic assumptions.

The largest accounts are work accounts (29% of the overall liability), the earners accounts (35%) and the motor vehicle account (24%).

### I.2 Experience in Six Months to 30 September 2007

The actual experience, in terms of both active claims in the September quarter and payments made, was close to the overall expected amount. There was some variation by account, as shown in Section 17.1 of the PwC report.

Payment experience over the period tended to be more favourable (compared to expected) for the older accident years (up to 2000).

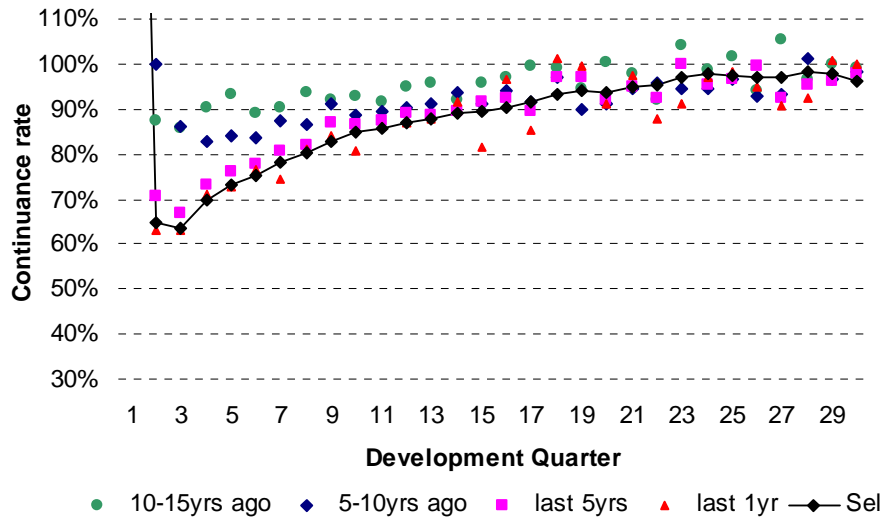
Overall, there were no departures from the previous projections that were a cause for concern.

### I.3 Valuation Assumptions

#### Continuance Rates

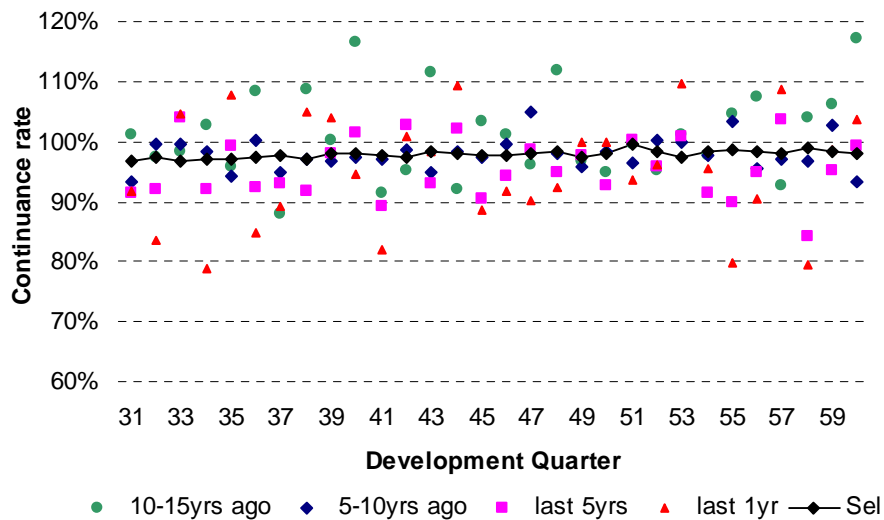
The following charts show the continuance rates for various development quarters for all accounts combined.

**Figure I.1 - Continuance rates for delay quarters 1-30, all accounts**



The chart above indicates that continuance rates for the early development quarters have trended down over time. The most recent year's experience continues this general trend. PwC have selected continuance rates near or in line with this recent experience that appear sensible.

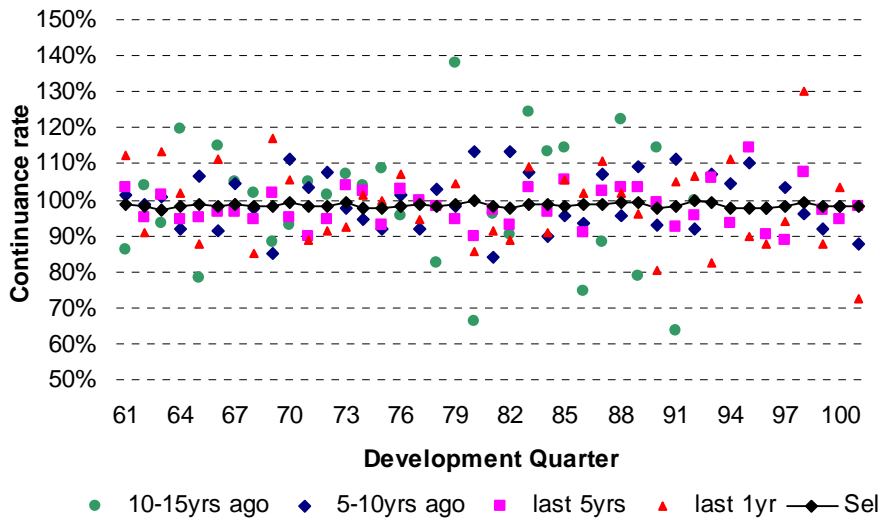
**Figure I.2 - Continuance rates for delay quarters 31-60, all accounts**



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In the chart above the actual experience for each period shown is more volatile. The PwC selections seem reasonable, although we query the justification for or value in varying the continuance rate from quarter to quarter for these development.

**Figure I.3 - Continuance rates for delay quarters 61 and later, all accounts**



Similar comments for Figure I.2 apply to Figure I.3 above. However, the volatility in actual experience is greater so any trend is difficult to find. The selected rates appear to be broadly reasonable.

Referring to the PwC report, the continuance rates have been fine-tuned since the previous valuation to respond to recent experience. Overall we note that the selected continuance rates for vocational rehab seem reasonable.

### PPACs

The following charts show the PPAC assumptions for the same development quarter groupings as for continuance rates above, across all accounts.

**Figure I.4 – PPACs for delay quarters 1-30, all accounts**

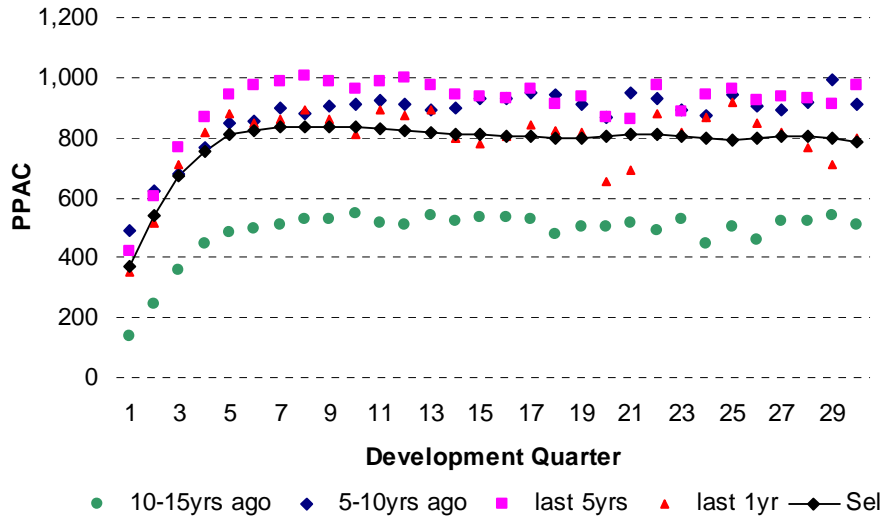
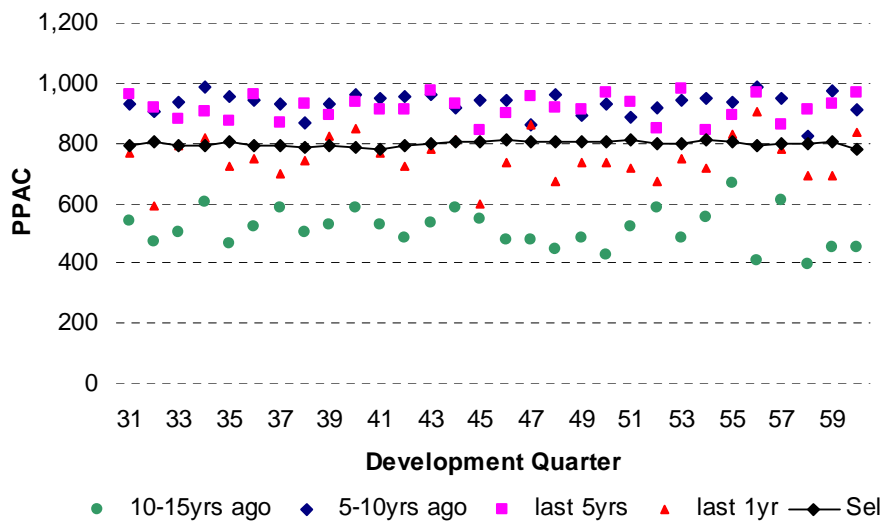


Figure I.4 illustrates two important points regarding PPAC experience for the earlier development quarters:

- The payment per active claim in the first year is lower than later quarters, steadily increasing after which payments tend to stabilise at a steady rate.
- The level of PPACs has increased significantly from 10-15 years ago. While the latest year’s payments are lower than the last ten years, they are still considerably higher than the older period shown (10-15 years ago).

The higher PPACs observed coincide with lower continuance rates for vocational rehab payments, as noted earlier. In other words, fewer claimants are receiving larger rehab benefits on average. Such a phenomenon may be observed if benefit eligibility rules are tightened, for instance.

**Figure I.5 – PPACs for delay quarters 31-60, all accounts**



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Figure I.5 shows similar experience regarding the levels of PPAC for the various periods of experience, as per Figure I.4. The experience for each period is flat over this period of development.

**Figure I.6 – PPACs for delay quarters 61 and later, all accounts**

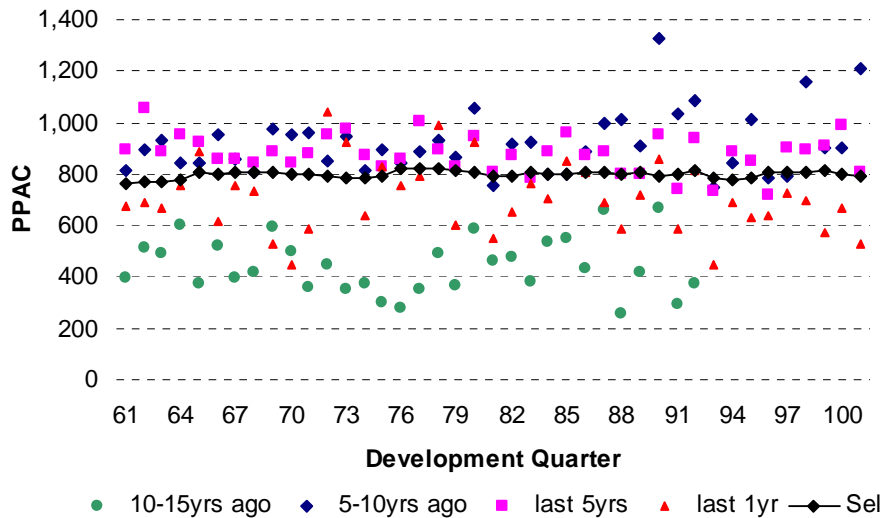


Figure I.6 also shows similar experience regarding the shifting levels of PPAC for different experience periods, as per Figure I.4. There is also no notable trend over the development quarters shown. However, unlike Figure I.5 there is greater volatility in the experience.

PwC’s selections reflect the latest experience year for development up to 60 quarters and move toward the higher five year average for later development quarters. This does not appear unreasonable.

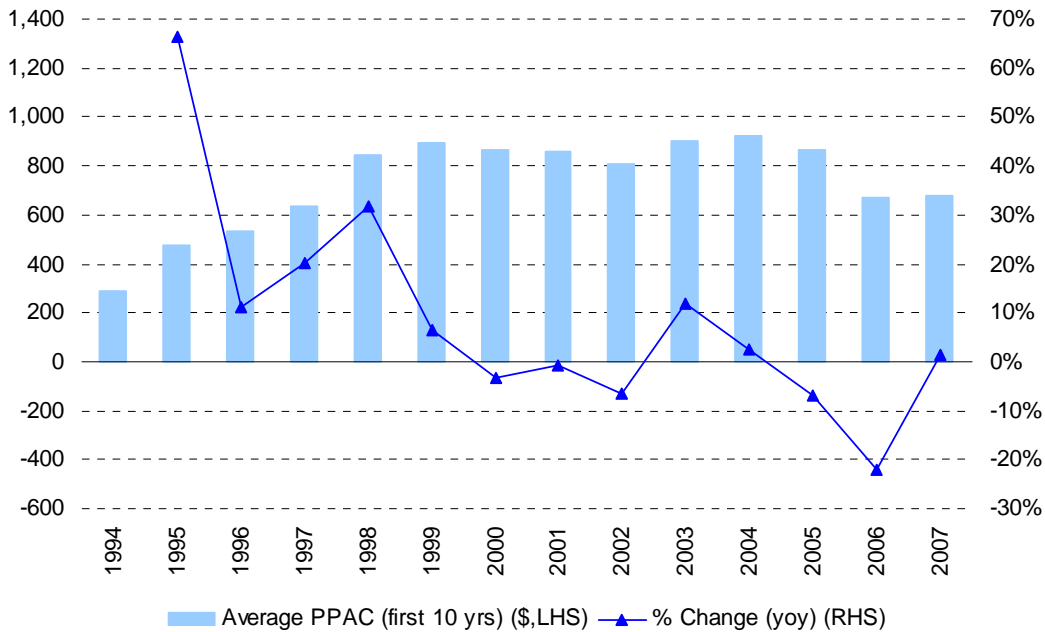
### Superimposed Inflation

There is no discussion of superimposed inflation within the vocational rehab benefits section of the PwC report. We have analysed the payment data to assess superimposed inflation.

The following chart shows the average inflation-adjusted quarterly PPAC within a financial year for payments made in the first 10 years after accident, across all accounts.

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Figure I.7 - PPACs by payment year (first 10 years), all accounts



If we measure superimposed as being the increase in the PPACs above, then superimposed inflation was:

- Around 9% p.a. over the entire period shown
- -3% in the last five years.

Given the greater relevance of more recent experience and the flat PPAC experience observed since 1998, an assumption of nil superimposed inflation is reasonable. We are giving no weight to the increases observed over the period 1995 to 1999 in drawing this conclusion.

It would be more prudent to allow for some future superimposed inflation. A rate of up to 3% p.a. could be justified based on the above analysis. However, nil superimposed inflation is justified based on the analysis above if there are no other known qualitative factors that support a higher rate for the future.

## I.4 Conclusions

PwC's projection of the outstanding claims liability for vocational rehab benefits as at 30 June 2008 is \$148 million, compared with the projection from 30 June 2007 of \$147 million. The change is marginal. The PwC report demonstrates that the higher continuance rates assumed are largely offset by lower PPACs compared to the previous valuation. However, we do note that the longer term experience is that continuance rates have decreased while PPACs have increased.

Based on our review we conclude that the methodology, assumptions and liability estimate for the vocational rehab benefit are reasonable.

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## **I.5 Recommendations**

None.

## J Hospital Rehabilitation

Hospital Rehabilitation (Hospital Rehab) benefits comprise inpatient elective surgery procedures.

### J.1 Result

The projected 30 June 2008 outstanding claims liability projected from 31 December 2007 data for hospital rehab benefits is \$869 million. The following table shows this liability as at 30 June 2008 compared with the same estimate projected from 30 June 2007 data, noting that changes in economic assumptions are excluded from the comparison.

**Table J.1 – Hospital Rehab Benefits – 30 June 2008 (\$m)<sup>1</sup>**

Account	Experience		Projected at 31/12/07	% change	Proportion of Liability
	Projected at 30/6/07	& model changes			
Employers			75		9%
Residual Work			60		7%
Partnership Program			10		1%
Self Employed			25		3%
Total WC			169		19%
Earners			289		33%
Residual Non Work			73		8%
Total Earners			362		42%
Treatment Injury			48		6%
Motor Vehicle			130		15%
Non Earners			160		18%
Total	845	24	869	2.8%	100%

<sup>1</sup> after allowance for changes in economic assumptions

Across all accounts, the current estimate of the liability as at 30 June 2008 is 2.8% higher from that projected as at 30 June 2007. From the information presented we are unable to show the projected liability as at 30 June 2008 from the 30 June 2007 valuation by account on the current economic assumptions.

The largest accounts are earners accounts (42% of the overall liability), the work accounts (19%) and the non-earners account (18%).

### J.2 Experience in Six Months to 30 September 2007

The actual experience, in terms of both active claims in the September quarter and payments made, was materially lower than expected (actual was 88% of expected for continuance rates and 90% for payments). PwC attribute most of this variation to delays in approvals for elective surgery. Adjusting for this factor, PwC state that the experience was marginally favourable.

### Continuance Rates

The following charts show the continuance rates for various development quarters for all accounts combined.

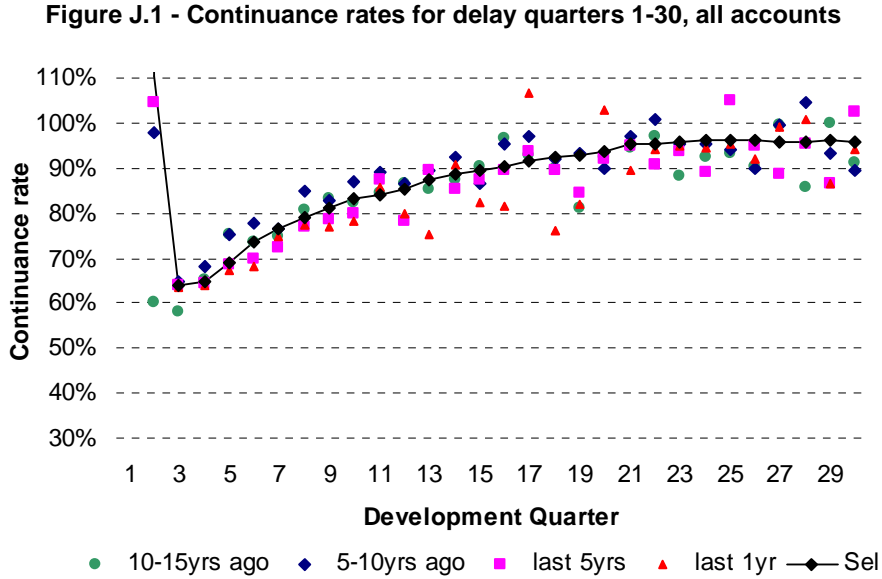
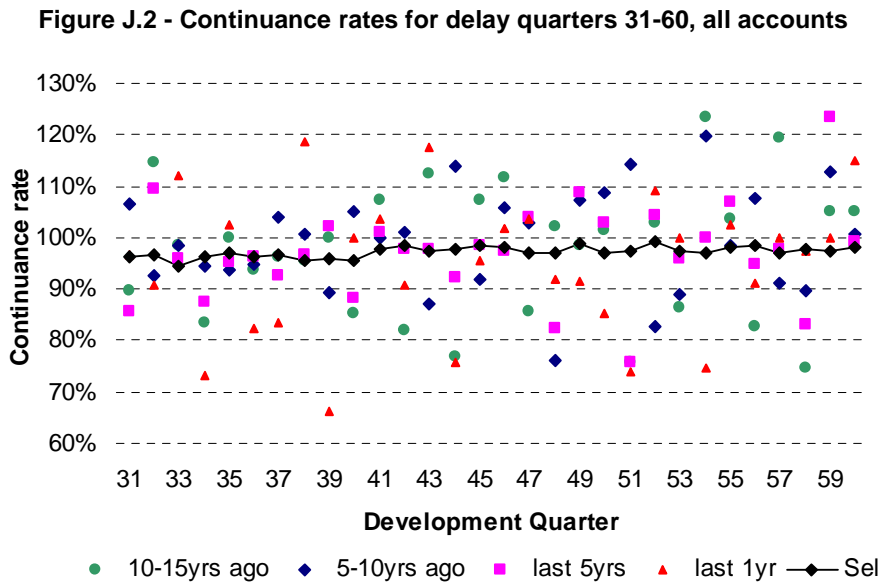


Figure J.1 above indicates that continuance rates for the early development quarters have been fairly stable over time. The selected rates appear reasonable.



In Figure J.2 above the actual experience is volatile and there is no discernable trend. The selections appear to be appropriate.

Figure J.3 - Continuance rates for delay quarters 61 and later, all accounts

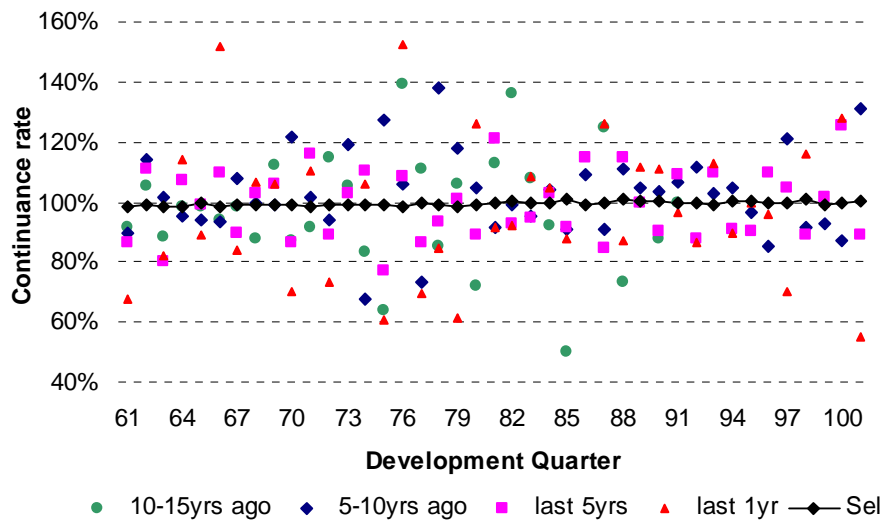


Figure J.3 also shows no clear trend in continuance rate experience over time. The selected rates for these later delay quarters are all near 100% and appear reasonable.

Referring to the PwC report, the continuance rates have been fine-tuned since the previous valuation to respond to recent experience. They are slightly slower in some places than the previous valuation but largely unchanged. To adjust for the expected “catch-up” in elective surgery referred to above, PwC have allowed for a higher number of active claims. As such, PwC have made no change to the continuance rates selected for this expected variation in experience. We have not examined the precise impact on the projection from this approach but do note that it seems reasonable.

Overall we had no material concerns with the PwC continuance rates selected.

### PPACs

The following charts show the PPAC assumptions for the same development quarter groupings as for continuance rates above, across all accounts.

**Figure J.4 – PPACs for delay quarters 1-30, all accounts**

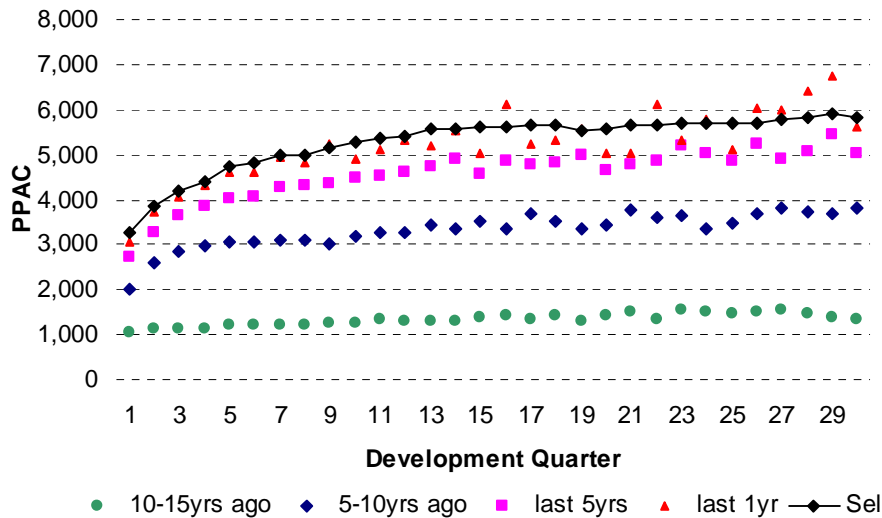


Figure J.4 illustrates two important points regarding PPAC experience for the earlier development quarters for hospital rehab:

- The payment per active claim is lower in earlier than later quarters, steadily increasing to about delay quarter 13, after which payments tend to stabilise.
- The level of PPACs has increased significantly from 10-15 years ago. This feature has been observed for other benefits (e.g. vocational rehab).

**Figure J.5 – PPACs for delay quarters 31-60, all accounts**

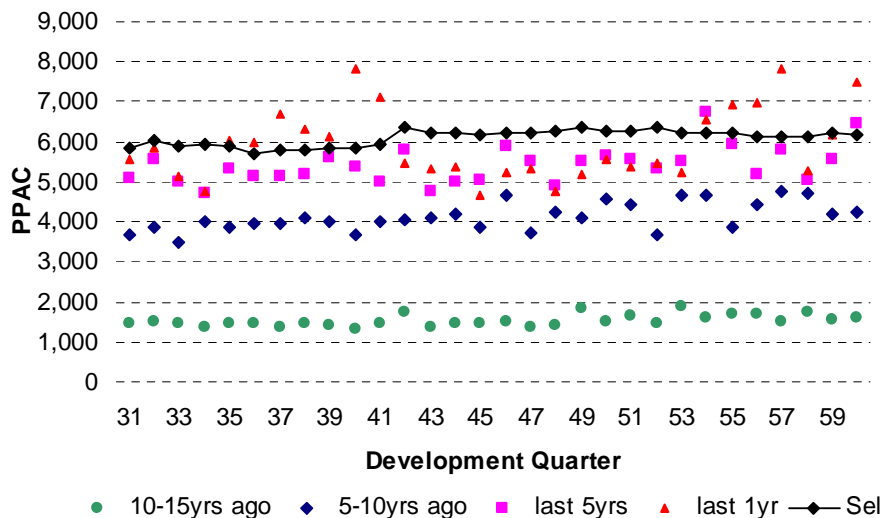


Figure J.5 shows similar experience re the levels of PPAC for the various periods of experience, as per Figure J.4. The experience for each period is flat over delay quarters 31-60.

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**Figure J.6 – PPACs for delay quarters 61 and later, all accounts**

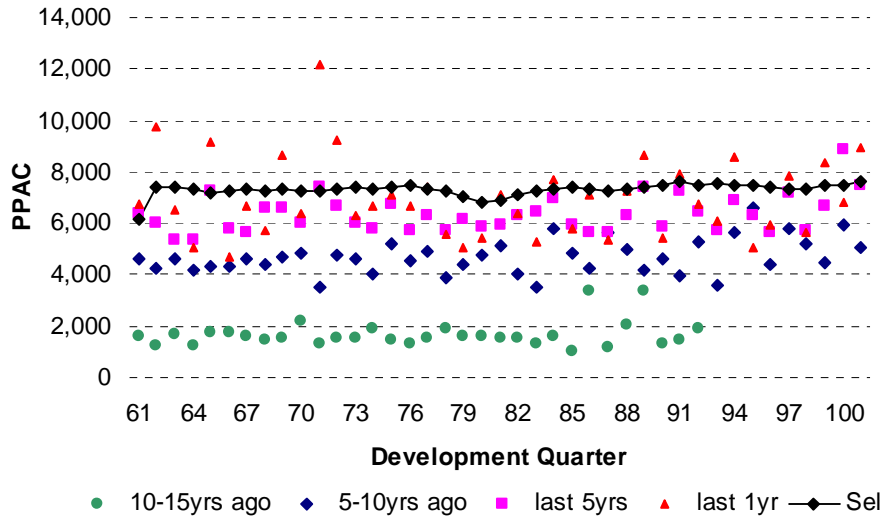


Figure J.6 also shows similar experience regarding the shifting levels of PPAC for different experience periods, as per Figure J.4. There is also no notable trend over the development quarters shown.

The average quarterly PPAC for hospital rehab benefits stabilises at around \$6,000 to delay quarter 61 and then around \$7,500 thereafter. The higher level of payments per claim for this benefit relative to other benefits (e.g. vocational rehab) reflects the greater expense expected for this type of rehabilitation.

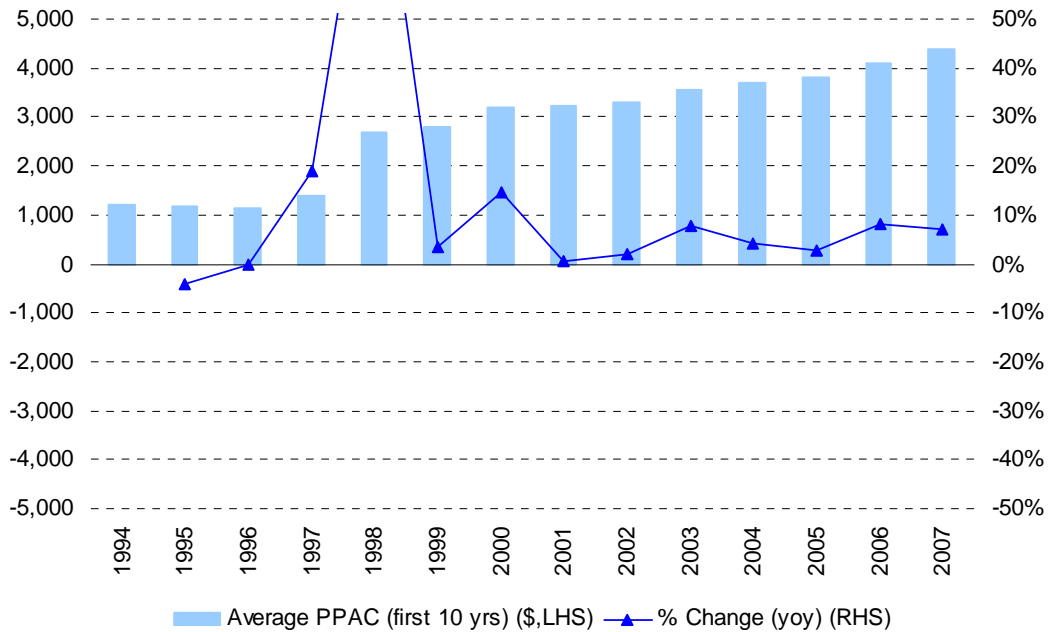
We note that the PPAC selections are at the top end of observed experience, reflecting the increasing trend shown. The selected amounts appear reasonable.

### Superimposed Inflation

Figure J.7 below shows the average inflation-adjusted quarterly PPAC within a financial year for payments made in the first 10 years after accident, across all accounts.

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Figure J.7 – PPACs by payment year (first 10 years), all accounts



If we measure superimposed as being the increase in the PPACs above, then superimposed inflation was:

- 12% p.a. over full period 1995 to 2007
- 6% p.a. in the last five years.

There is clearly superimposed inflation present in the experience for hospital rehab. The PwC rates selected of 6.0% p.a. for 2008 and 5.0% for 2009 seem appropriate. However, the selected rate for 2010 and later of 1.5% p.a. seems low. Further justification of this lower assumption relative to recent experience should have been made in our opinion.

#### J.4 Conclusions

PwC's projection of the outstanding claims liability for hospital rehab benefits as at 30 June 2008 is \$869 million, compared with the projection from 30 June 2007 of \$845 million (ignoring changes in economic assumptions). PwC note the impact on recent and prospective experience of delays in elective surgery. Their means for dealing with this seem sensible.

Based on our review we conclude that the methodology and assumptions but for superimposed inflation for the hospital rehab benefit are reasonable.

#### J.5 Recommendations

Greater disclosure of the justification of the long term superimposed inflation assumption should be made.

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## K Other Rehabilitation

Other Rehabilitation (Other Rehab) benefits comprise those other rehabilitation payments not included in the Hospital or Vocational Rehabilitation benefit types, including death related benefits, dental, transport and backdated attendant care payments.

### K.1 Result

The projected 30 June 2008 outstanding claims liability projected from 31 December 2007 data for other rehab benefits is \$550 million. Table K.1 below shows this liability as at 30 June 2008 compared with the same estimate projected from 30 June 2007 data, noting that changes in economic assumptions are excluded from the comparison.

**Table K.1 – Other Rehab Benefits - 30 June 2008 (\$m)<sup>1</sup>**

Account	Experience		Projected at 31/12/07	% change	Proportion of Liability
	Projected at 30/6/07	& model changes			
Employers			22		4%
Residual Work			24		4%
Partnership Program			2		0%
Self Employed			6		1%
<b>Total WC</b>			<b>54</b>		<b>10%</b>
Earners			110		20%
Residual Non Work			36		7%
<b>Total Earners</b>			<b>146</b>		<b>27%</b>
Treatment Injury			34		6%
Motor Vehicle			130		24%
Non Earners			186		34%
<b>Total</b>	<b>535</b>	<b>15</b>	<b>550</b>	<b>2.8%</b>	<b>100%</b>

<sup>1</sup> after allowance for changes in economic assumptions

Across all accounts, the current estimate of the liability as at 30 June 2008 is 2.8% higher from that projected as at 30 June 2007. From the information presented we are unable to show the projected liability as at 30 June 2008 from the 30 June 2007 valuation by account on the current economic assumptions.

The largest accounts are non-earners account (34% of the overall liability), the earners accounts (27%) and the motor vehicle account (24%). The work accounts are a relatively small component of the liability estimate for this benefit.

### K.2 Experience in Six Months to 30 September 2007

Actual payment experience in the period was 103% of expected amounts.

Overall, there were no departures from the previous projections that were a cause for concern.

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### K.3 Valuation Assumptions

#### Payment Decay Rates

This benefit type was modelled using a payment decay methodology. These payment decay rates are similar to the continuance rates for the PPAC method.

The following charts show the payment decay rates for various development quarters for all accounts combined.

**Figure K.1 - Payment decay rates for delay quarters 1-30, all accounts, excl. backdated attendant care**

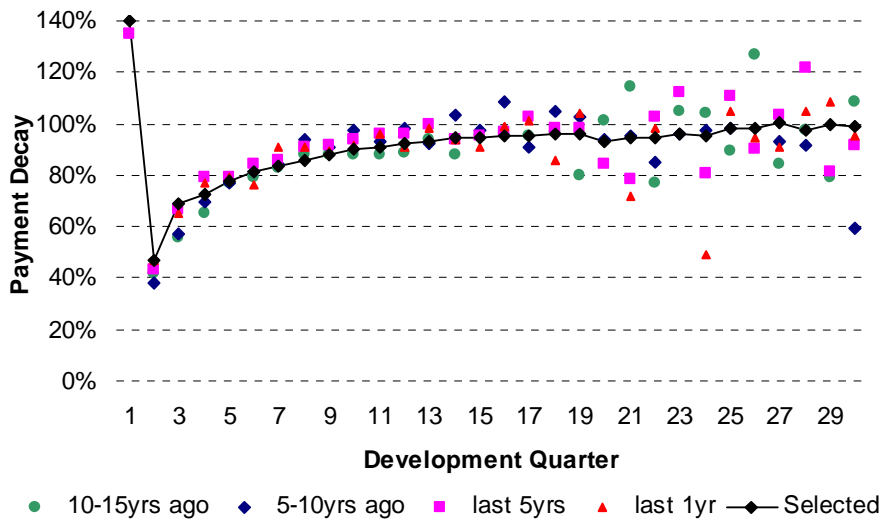


Figure K.1 above shows no clear trend in payment decay rates. The PwC selections appear to be broadly reasonable.

**Figure K.2 - Continuance rates for delay quarters 31-60, all accounts, excl. backdated attendant care**

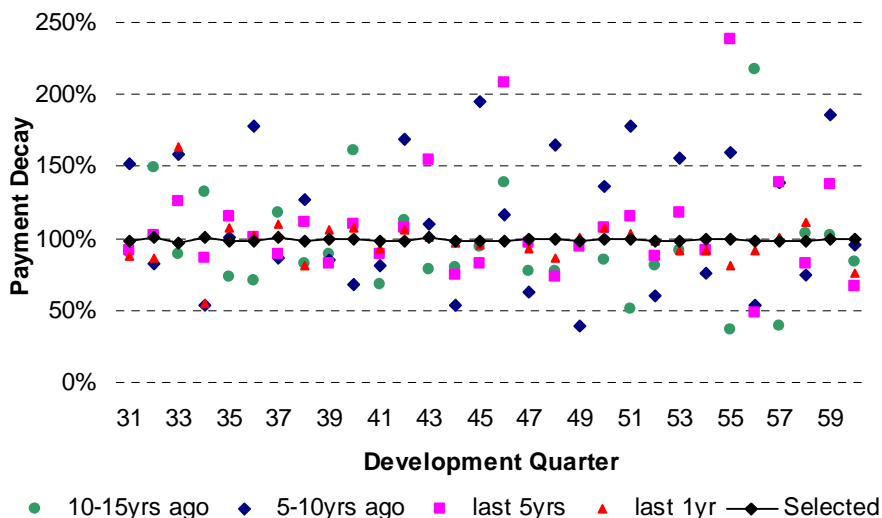
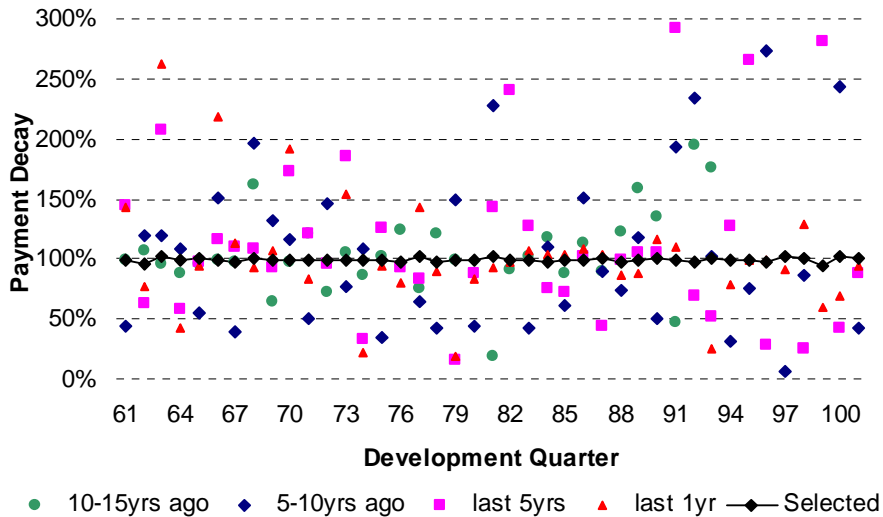


Figure K.2 demonstrates considerable volatility in actual payment decay rates. The PwC basis again seems sensible.

**Figure K.3 - Continuance rates for delay quarters 61 and later, all accounts, excl. backdated attendant care**



We did not analyse backdated attendant care payments due to their irregular nature. Furthermore, the data for such analysis was not supplied.

Similar comments apply for Figure K.3 as were made for Figure K.2.

### Superimposed Inflation

There is no superimposed inflation for this projection methodology.

## K.4 Conclusions

PwC’s projection of the outstanding claims liability for other rehab benefits as at 30 June 2008 is \$550 million, compared with the projection from 30 June 2007 of \$535 million (ignoring changes in economic assumptions).

Overall, the valuation as at 30 June 2008 did not change materially. A higher estimate due to experience was partly offset by lower payment continuance rates (mainly for backdated attendant care assumptions).

Based on our review we conclude that the methodology, assumptions and liability estimate for the other rehab benefits are reasonable.

## K.5 Recommendations

None.

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## L Medical – GP

Medical – GP benefits comprise payments for consultations with general practitioners which are eligible under ACC's rules.

### L.1 Result – Total Medical Benefits

The projected 30 June 2008 outstanding claims liability projected from 31 December 2007 data for all medical benefits is \$1092 million. The following table shows this liability as at 30 June 2008 compared with the same estimate projected from 30 June 2007 data, noting that changes in economic assumptions are excluded from the comparison.

**Table L.1 - Vocational Rehab Benefits - 30 June 2008 (\$m)<sup>1</sup>**

Account	Experience		Projected at 31/12/07	% change	Proportion of Liability
	Projected at 30/6/07	& model changes			
Employers			103		9%
Residual Work			119		11%
Partnership Program			8		1%
Self Employed			34		3%
<b>Total WC</b>			<b>264</b>		<b>24%</b>
Earners			319		29%
Residual Non Work			41		4%
<b>Total Earners</b>			<b>360</b>		<b>33%</b>
Treatment Injury			44		4%
Motor Vehicle			142		13%
Non Earners			282		26%
<b>Total</b>	<b>1,085</b>	<b>7</b>	<b>1,092</b>	<b>0.6%</b>	<b>100%</b>

<sup>1</sup> after allowance for changes in economic assumptions

While PwC project the medical benefits split into the sub-categories of GPs, Physiotherapy, Radiology and Other, the summary results are not split by these sub-categories. As such we have summarised the overall results above.

Across all accounts, the current estimate of the liability as at 30 June 2008 is only 0.6% higher from that projected as at 30 June 2007. From the information presented we are unable to show the projected liability as at 30 June 2008 from the 30 June 2007 valuation by account on the current economic assumptions.

The largest accounts are earners accounts (33% of the overall liability), the non-earners account (26%) and the work accounts (24%).

### L.2 Experience in Six Months to 30 September 2007

Actual experience for both active number of claims and payments was very close to expected, across all accounts.

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### L.3 Valuation Assumptions

#### Continuance Rates

The following charts show the continuance rates for various development quarters for all accounts combined.

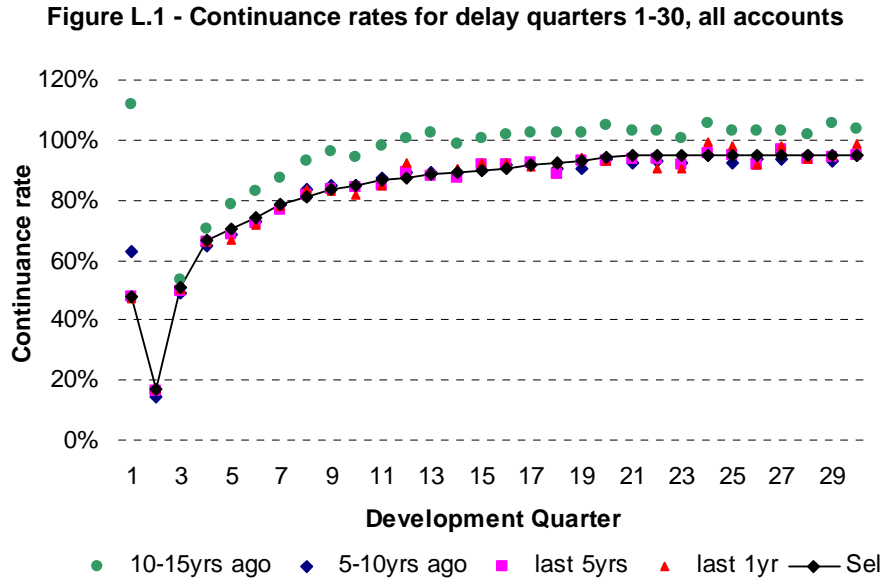
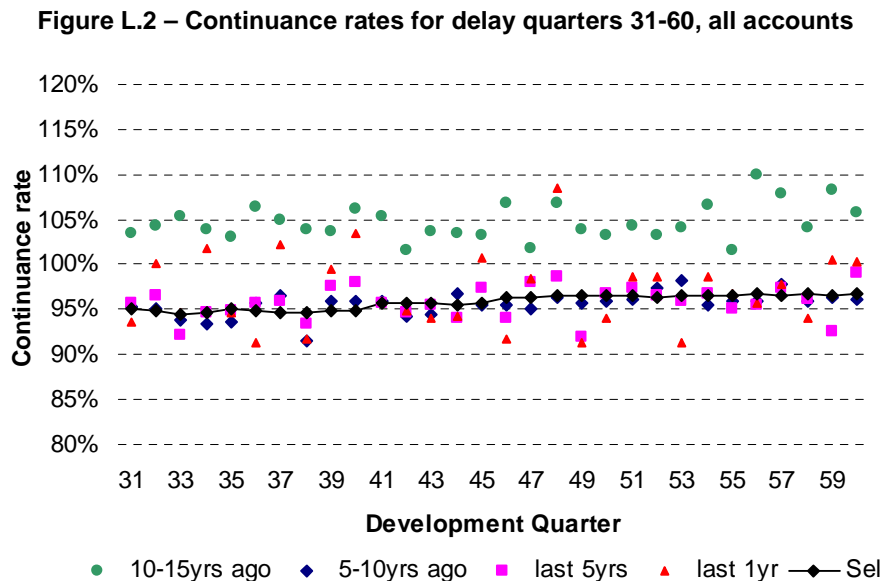


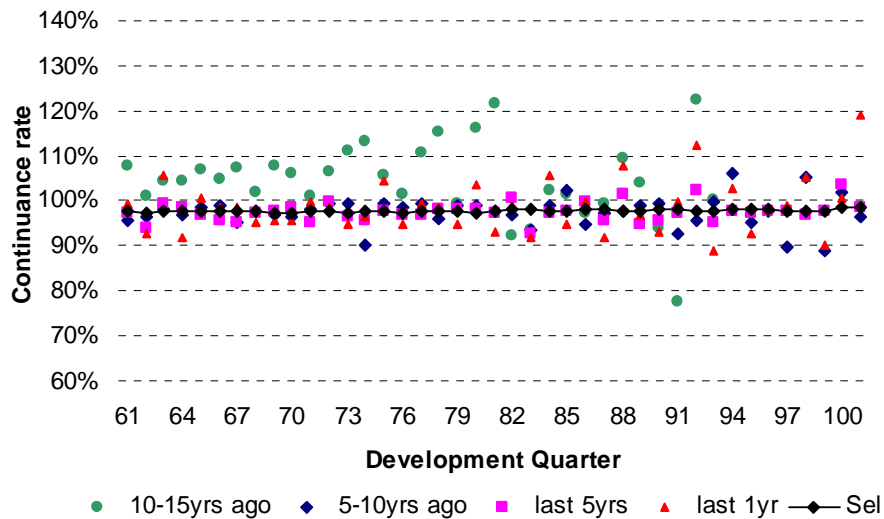
Figure L.1 above indicates that continuance rates for the early development quarters decreased from 10-15 years ago to more recent periods, where rates have been very stable. PwC have selected rates in line with this recent experience.



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In Figure L.2 a decrease in continuance rates was observed from the 10-15 years ago period to later periods. While the observed rates are more volatile than earlier delay quarters, the pattern is still reasonably stable. The continuance rates are quite flat by delay quarter.

**Figure L.3 - Continuance rates for delay quarters 61 and later, all accounts**



Again, we note in Figure L.3 that observed continuance rates decreased from the earliest period shown, although the experience is more volatile than earlier delay quarters and the trend is not as apparent. The continuance rates selected are flat over this period, at around 97-98%.

Overall the selected continuance rates for Medical GP benefits seem reasonable.

### PPACs

The following charts show the PPAC assumptions for the same development quarter groupings as for continuance rates above, across all accounts.

Figure L.4 – PPACs for delay quarters 1-30, all accounts

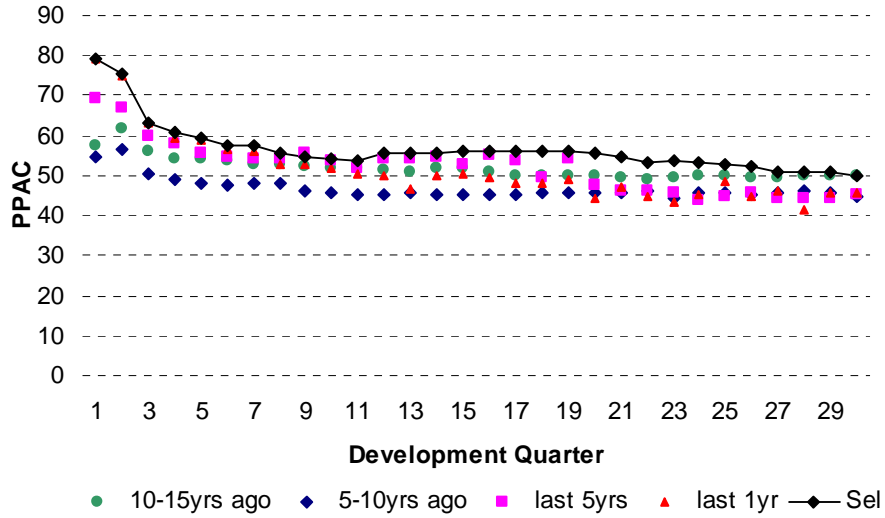
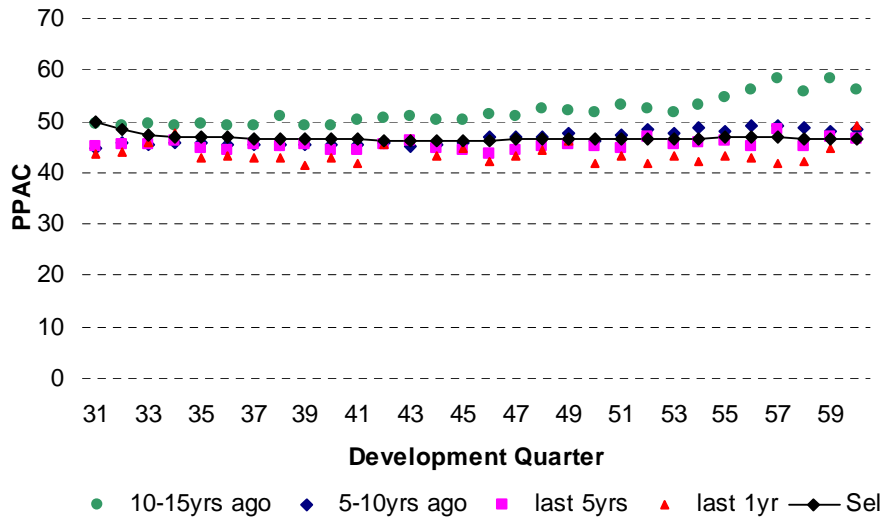
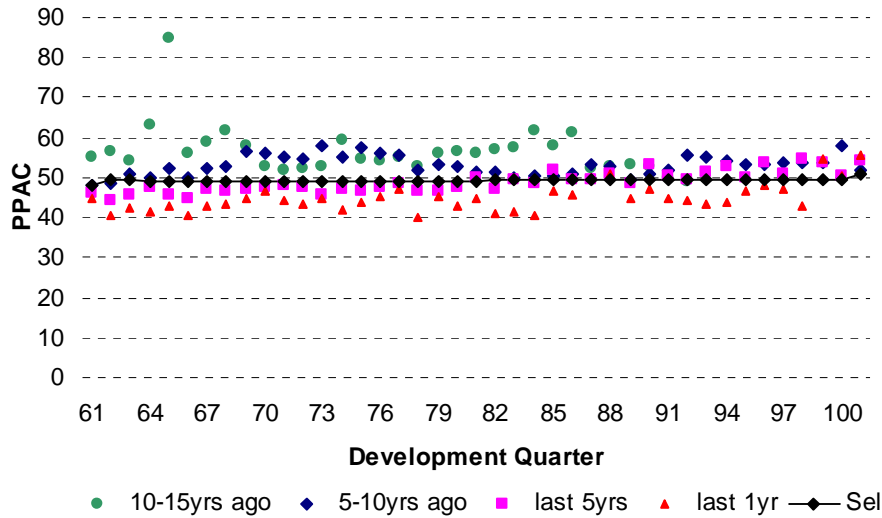


Figure L.5 – PPACs for delay quarters 31-60, all accounts



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Figure L.6 - PPACs for delay quarters 61 and later, all accounts



The PPAC experience is more stable for Medical GP benefits than for other benefit types for the same period observed (e.g. the various rehabilitation benefits). The general tendency has been for PPACs to increase over time at early durations and to decrease slightly over time in the tail.

The level of PPACs is lower than some other benefit types (such as rehabilitation), as might be expected. Also, the shape of the PPAC pattern is different in the early delay quarters, decreasing from a high level to stabilise at around \$50 per active claim per quarter in the tail.

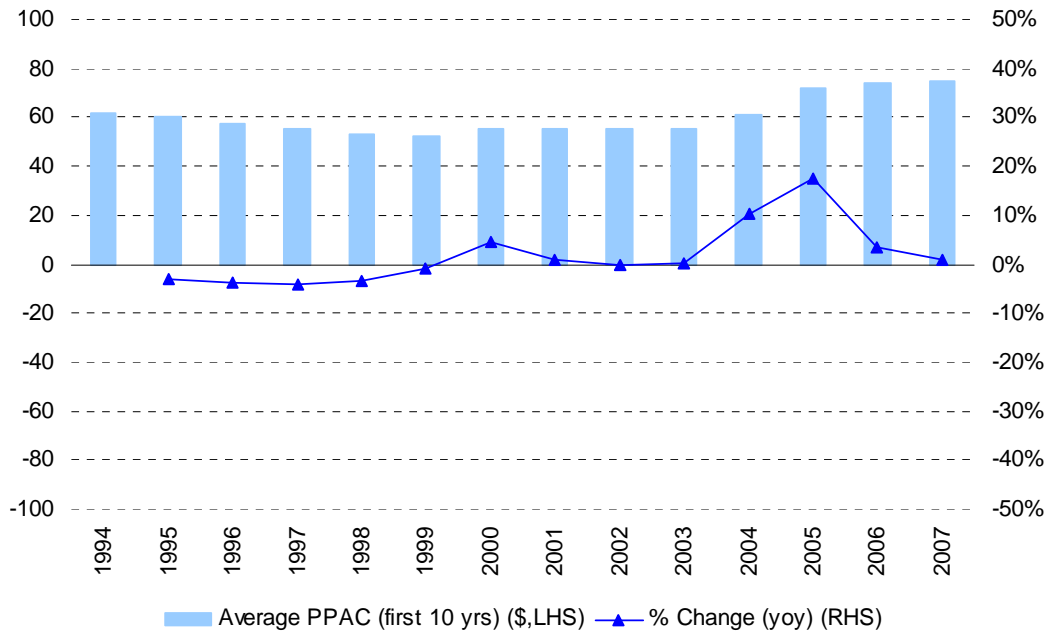
The selected PPACs appear reasonable.

### Superimposed Inflation

Figure L.7 below shows the average inflation-adjusted quarterly PPAC within a financial year for payments made in the first 10 years after accident, across all accounts.

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**Figure L.7 – PPACs by payment year (first 10 years), all accounts**



If we measure superimposed as being the increase in the PPACs above, then superimposed inflation was:

- Around 2% p.a. over the entire period shown
- 6% p.a. in the last five years.

PwC assume 1% superimposed inflation for all future years. This is a broadly reasonable assumption.

#### L.4 Conclusions

PwC’s projection of the outstanding claims liability for Medical GP benefits as at 30 June 2008 is \$54 million. This is a \$1m decrease from the previous valuation’s projected result at this date.

Based on our review we conclude that the methodology, assumptions and liability estimate for the vocational rehab benefit are reasonable.

#### L.5 Recommendations

None.

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## M Medical – Physiotherapy

### M.1 Result

We commented on the result for total medical benefits in Section 17.1. PwC do not split the valuation results further by the sub-categories of medical benefit as per their modelling approach. The earlier split has not been reproduced here.

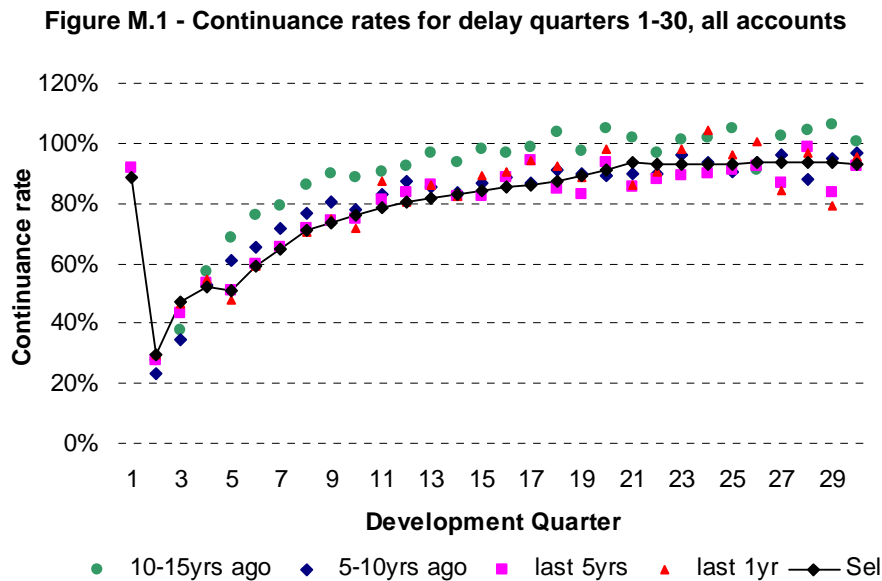
### M.2 Experience in Six Months to 30 September 2007

The actual experience was reasonably close to expected experience from the previous valuation. There was nothing to indicate a significant deficiency in the previous valuation method or assumptions.

### M.3 Valuation Assumptions

#### Continuance Rates

The following charts show the continuance rates for various development quarters for all accounts combined.



The chart above indicates that continuance rates for the early development quarters have trended down over time. The most recent year's experience is in line with the last five years of experience. PwC have selected continuance rates near or in line with this recent experience that appear sensible.

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**Figure M.2 – Continuance rates for delay quarters 31-60, all accounts**

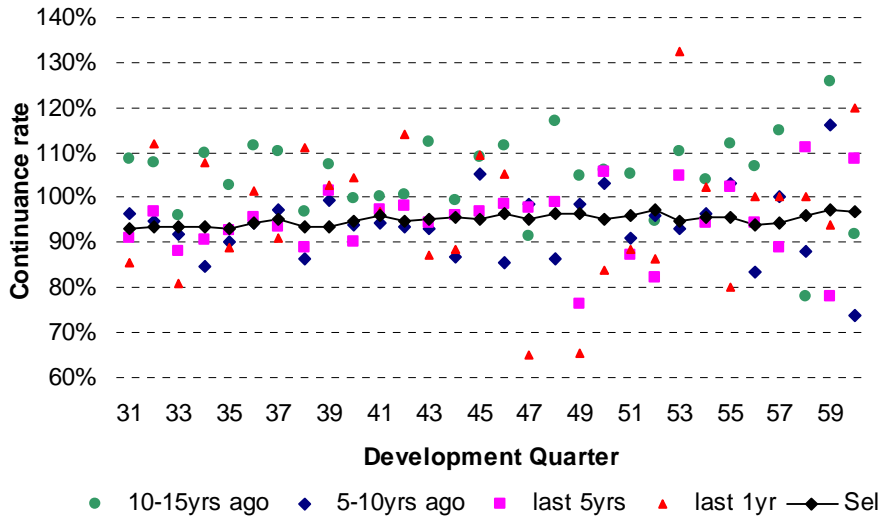


Figure M.2 above shows much more variable experience. Despite this volatility, the level of continuance rates for the delay quarters shown has decreased over time.

**Figure M.3 – Continuance rates for delay quarters 61 and later, all accounts**

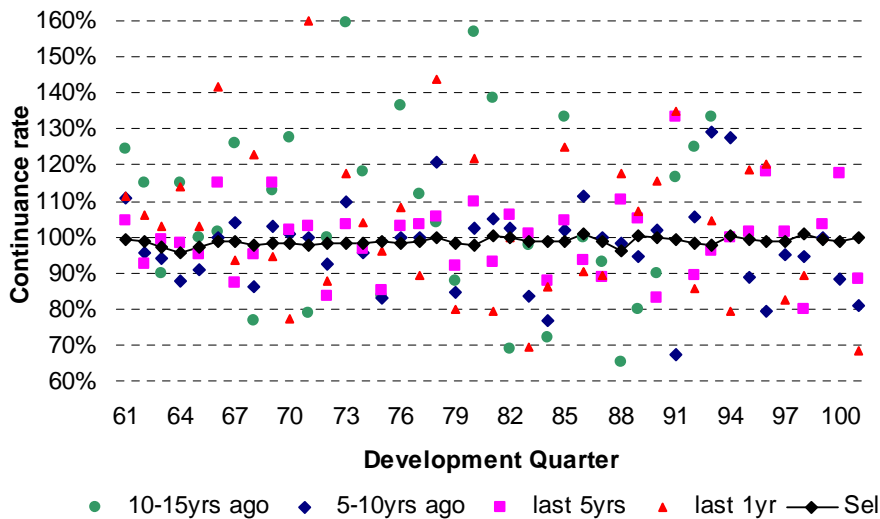


Figure M.3 demonstrates greater volatility in continuance rates over time and no clear trend.

Overall, the continuance rates selected appear to be broadly reasonable.

### PPACs

The following charts show the PPAC assumptions for the same development quarter groupings as for continuance rates above, across all accounts.

Figure M.4 - PPACs for delay quarters 1-30, all accounts

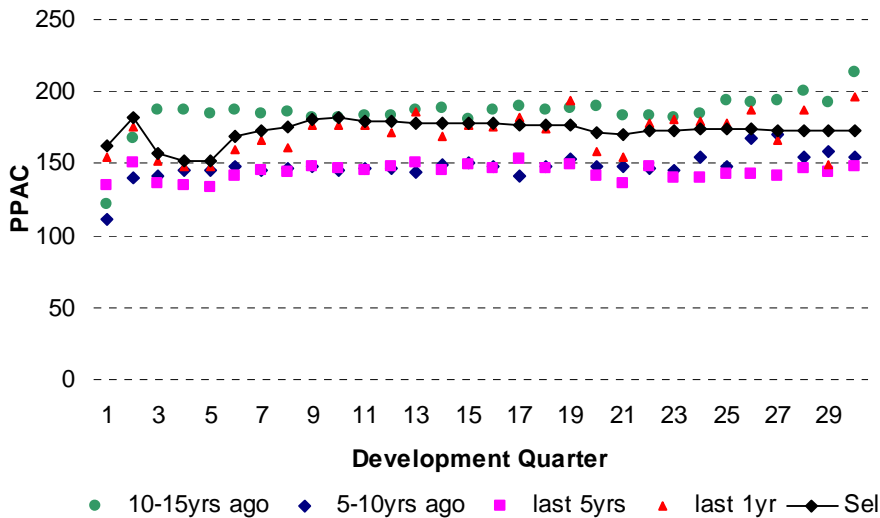


Figure M.4 illustrates two important points regarding PPAC experience for the earlier development quarters:

- The payment per active claim is relatively flat by delay quarter.
- The level of PPACs has decreased from 10-15 years ago, from approximately \$180 per quarter to \$150 per active claim per quarter on average over the next ten years. Despite this, the latest year’s experience was nearer \$175 on average over the delay quarters shown.

Figure M.5 - PPACs for delay quarters 31-60, all accounts

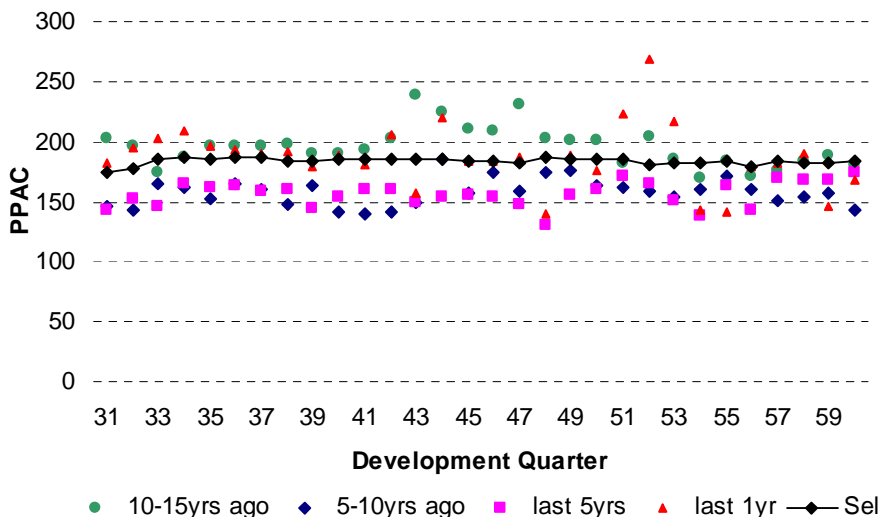


Figure M.5 shows similar experience re the levels of PPAC for the various periods of experience, as per Figure M.4. The experience for each period is flat over this period of development.

**Figure M.6 – PPACs for delay quarters 61 and later, all accounts**

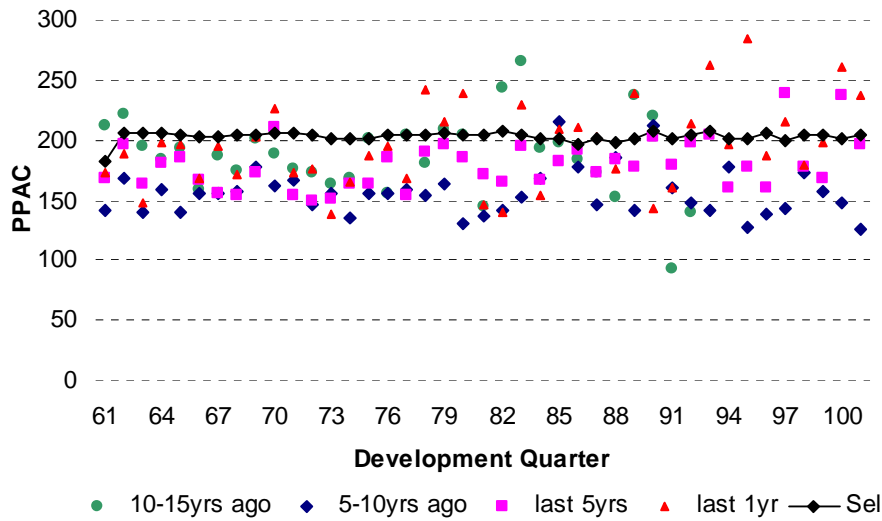


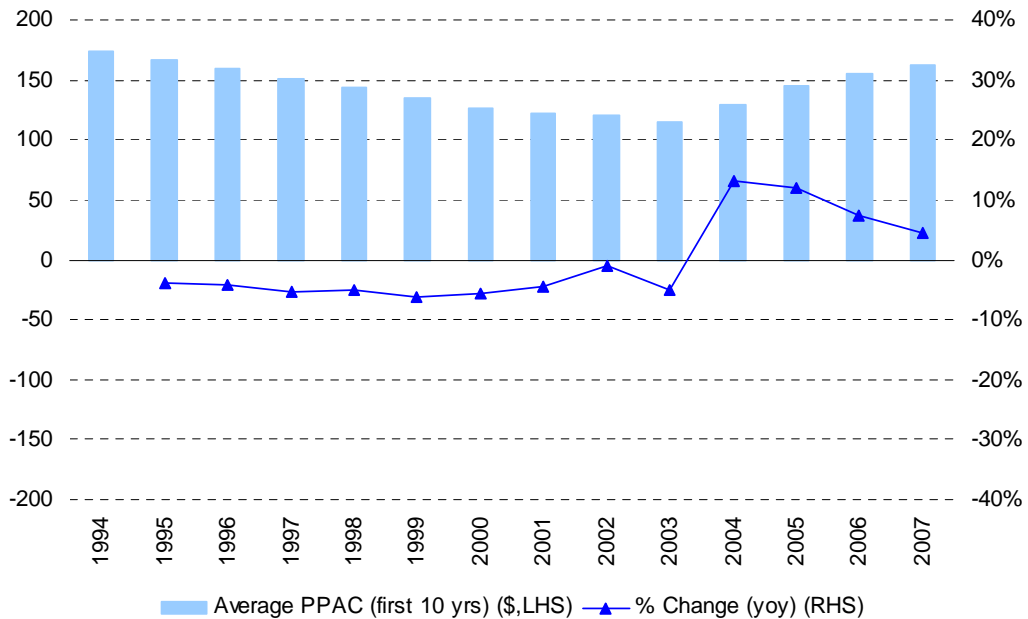
Figure M.6 also shows flat experience by delay quarter. However, unlike Figure M.5 there is greater volatility in the experience.

The PwC selections for PPACs seem reasonable.

### Superimposed Inflation

Figure M.7 below shows the average inflation-adjusted quarterly PPAC within a financial year for payments made in the first 10 years after accident, across all accounts.

**Figure M.7 – PPACs by payment year (first 10 years), all accounts**



If we measure superimposed as being the increase in the PPACs above, then superimposed inflation was:

- Nil over the entire period shown
- 6% p.a. for the last five years.

PwC selected rates of 5.5% p.a. for 2008, 3.0% p.a. for 2009 and 2.5% p.a. for later years. These seem reasonable, although further justification of the differential rates by year would have been useful.

#### **M.4 Conclusions**

PwC's projection of the outstanding claims liability for Medical Physio benefits as at 30 June 2008 is \$51 million, compared with the projection from 30 June 2007 of \$49 million. The change is small.

Based on our review we conclude that the methodology, assumptions and liability estimate for the Medical Physio benefits are reasonable.

#### **M.5 Suggestions**

Clearer documentation of the reasoning or analysis supporting the different superimposed inflation assumptions would be useful.

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## N Medical – Radiology

Medical Radiology benefits comprise radiology and related medical procedures and costs.

### N.1 Result

We commented on the result for total medical benefits in Section 17.1. PwC do not split the valuation results further by the sub-categories of medical benefit as per their modelling approach. The earlier split has not been reproduced here.

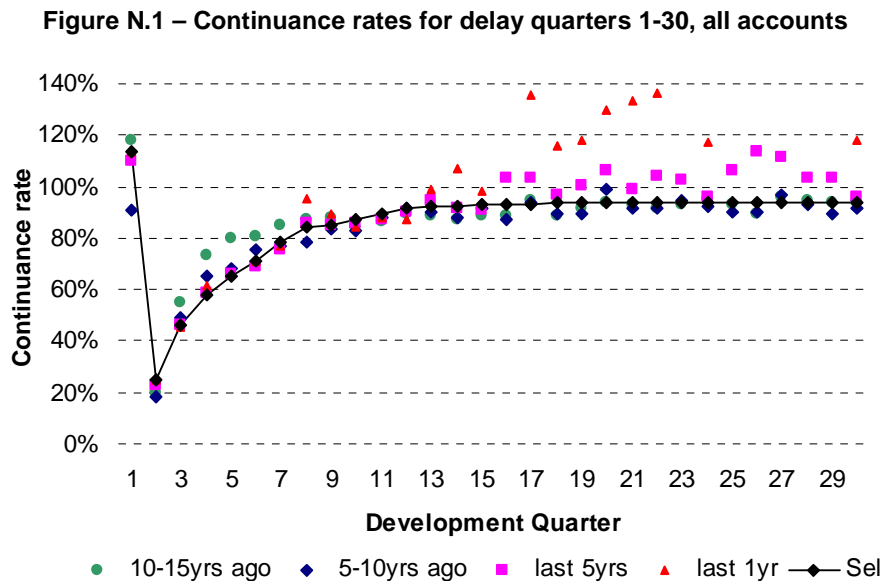
### N.2 Experience in Six Months to 30 September 2007

The actual number of active claims was 108% of expected in the September 2007 quarter. The actual payments for Medical Radiology benefits in the six months to 30 September 2007 were 104% of expected. While these were higher than expected they were within a reasonable range based on the previous valuation. These variations were not a cause for further concern.

### N.3 Valuation Assumptions

#### Continuance Rates

The following charts show the continuance rates for various development quarters for all accounts combined.



The chart above indicates that continuance rates for the early development quarters tend to increase rapidly from a low initial level up to delay quarter 13, then plateau at around 95%. There is no clear trend over time in the continuance experience, other than some observed increase for the latter part of Figure N.1 (i.e. delay quarters 16 to 30).

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The PwC selections for delay quarters 1 to 15 seem reasonable. In our opinion the selections for quarters 16 to 40 could justifiably be higher.

**Figure N.2 – Continuance rates for delay quarters 31-60, all accounts**

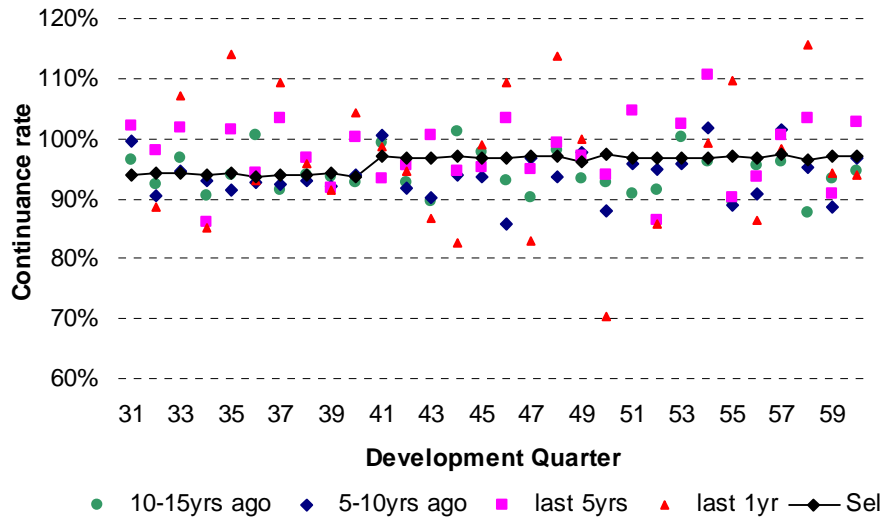
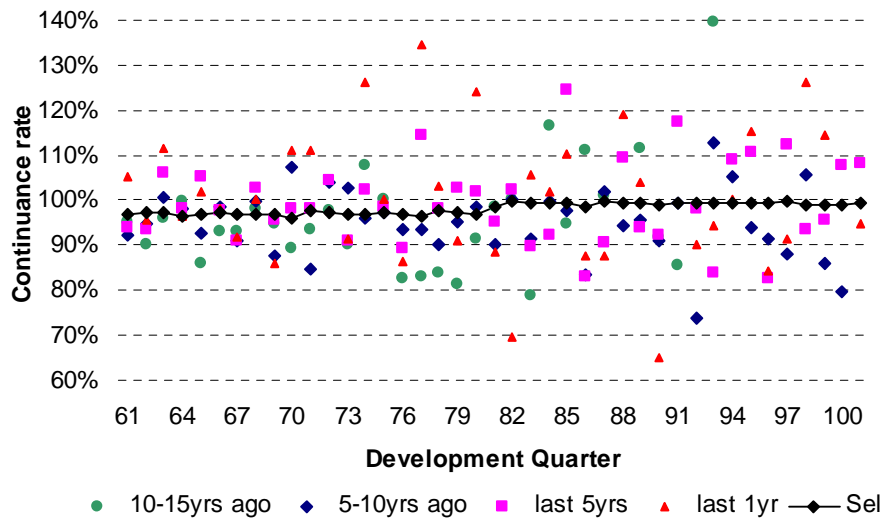


Figure N.2 above shows more volatile actual experience with clear trends difficult to identify. The PwC selections seem broadly reasonable, though we note that the recent experience for delay quarters 31 to 40 has mostly been above the selected continuance rates of 93-94%. Unless these can be justified we suggest rates nearer 97%, as per the later delay quarters.

**Figure N.3 – Continuance rates for delay quarters 61 and later, all accounts**



Similar comments as were made for Figure N.2 apply for Figure N.3 above.

The following charts show the PPAC assumptions for the same development quarter groupings as for continuance rates above, across all accounts.

**Figure N.4 – PPACs for delay quarters 1-30, all accounts**

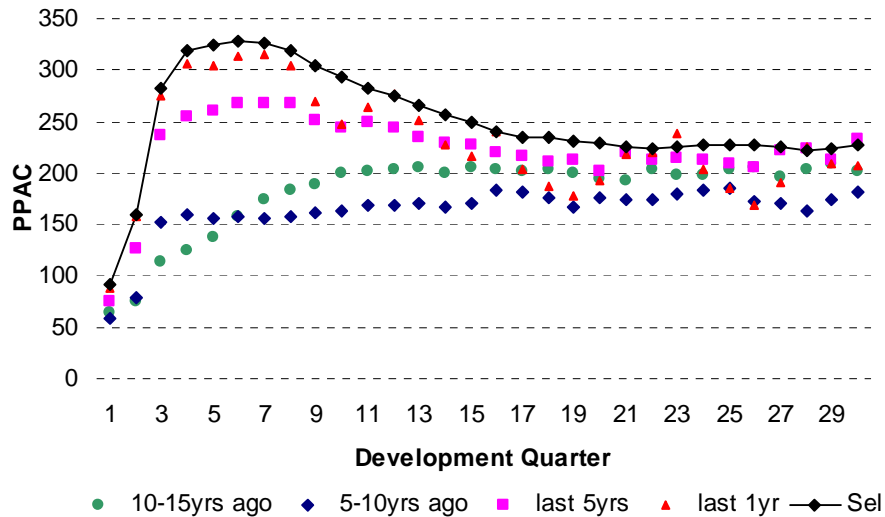


Figure N.4 illustrates two important features of the PPAC experience for the earlier development quarters:

- The pattern of PPACs by delay quarter has changed over time. For the periods 10-15 years ago and 5-10 years ago, it was a relatively flat pattern, gradually increasing to a stable level around development quarter 10. The pattern for the last five years has been a sharper increase to delay quarter 6 then a modest fall in payments, stabilising around the same point (delay quarter 10).
- The level of PPACs has increased modestly at later delays from around \$175 per active claim per quarter 5-10 years ago to around \$225 per active claim per quarter in the last five years.

**Figure N.5 – PPACs for delay quarters 31-60, all accounts**

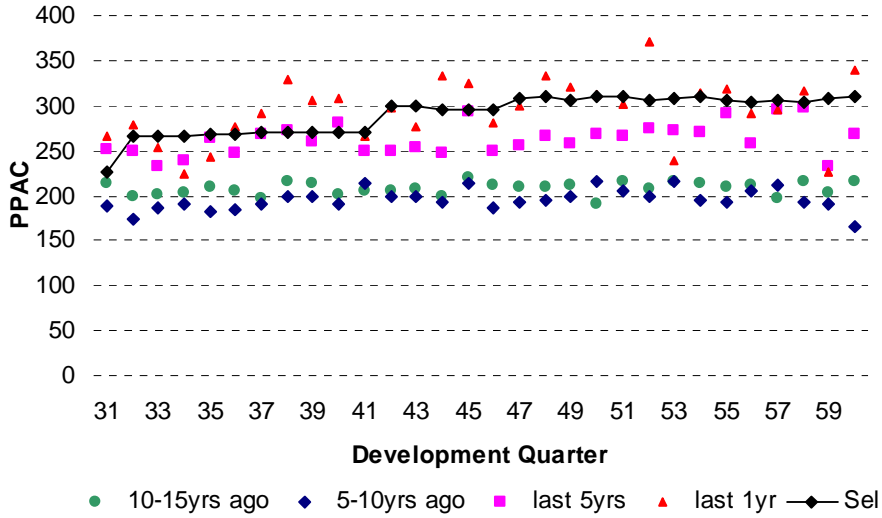
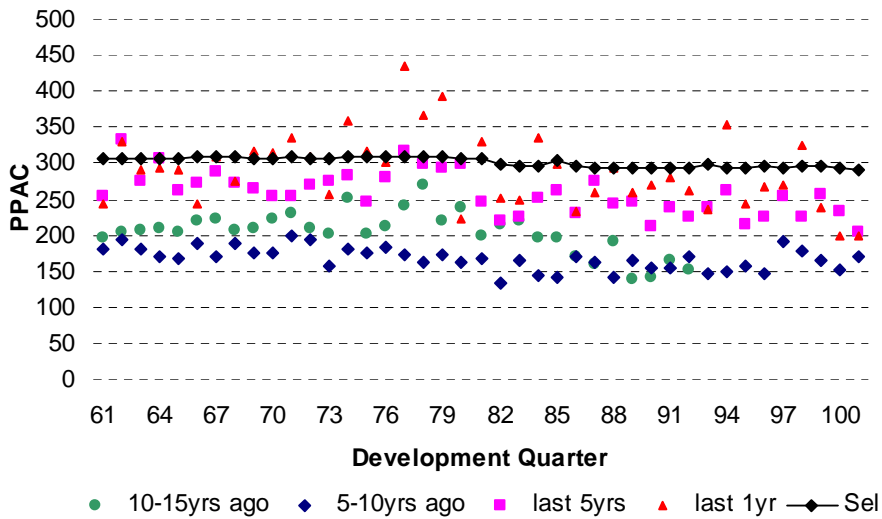


Figure N.5 shows flat PPAC patterns increasing over the last 15 years. The PwC selections have responded to this experience. The selections are near the last year’s experience, at the upper end of observed experience. It is important to understand if there is a justified reason for the future experience to continue at this level, to deteriorate further or to revert to a lower level. The chart for later PPAC experience in section 13.2.2 of the PwC report clearly identifies deteriorating experience and their projection expects this to continue. However, no commentary was provided for why this is happening.

**Figure N.6 – PPACs for delay quarters 61 and later, all accounts**



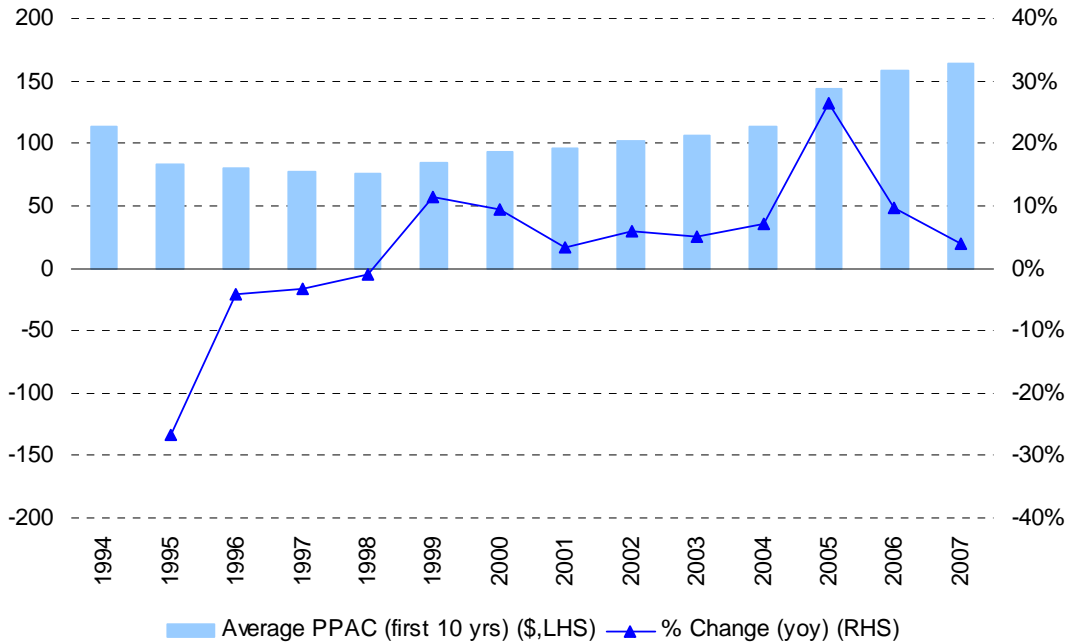
The comments for Figure N.5 also apply to Figure N.6.

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## Superimposed Inflation

Figure N.7 below shows the average inflation-adjusted quarterly PPAC within a financial year for payments made in the first 10 years after accident, across all accounts.

**Figure N.7 – PPACs by payment year (first 10 years), all accounts**



If we measure superimposed as being the increase in the PPACs above, then superimposed inflation was:

- 4% p.a. over the entire period shown
- 10% in the last five years.

PwC selected superimposed inflation assumptions of 4.0% p.a. in 2008 and 3.0% p.a. thereafter. While at the lower end of recently observed experience, these selections are reasonable.

## N.4 Conclusions

PwC's projection of the outstanding claims liability for Medical Radiology benefits as at 30 June 2008 is \$132 million, compared with the projection from 30 June 2007 of \$123 million. The increase of 7% is higher than other benefits but is minor in the context of the overall valuation.

Based on our review we conclude that the methodology, assumptions and liability estimate for the Medical Radiology benefits are reasonable.

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## **N.5 Recommendations**

None.

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## O Other Medical

Other Medical benefits comprise all those medical benefits not projected in the previous three sections.

### O.1 Result

We commented on the result for total medical benefits in Section 17.1. PwC do not split the valuation results further by the sub-categories of medical benefit as per their modelling approach. The earlier split has not been reproduced here.

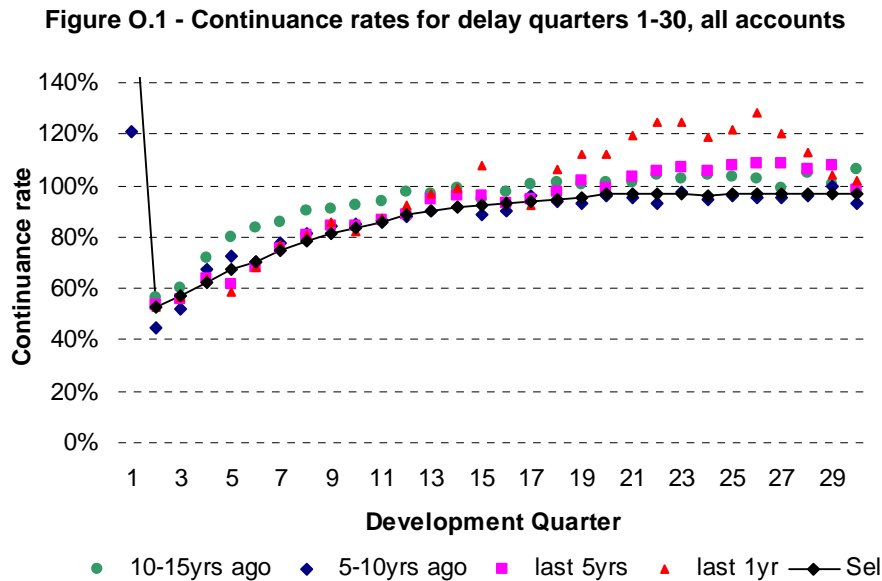
### O.2 Experience in Six Months to 30 September 2007

Actual experience was in line with a reasonable range of results, both for active claim numbers and payments. There were no variations that were a cause for concern.

### O.3 Valuation Assumptions

#### Continuance Rates

The following charts show the continuance rates for all accounts combined.

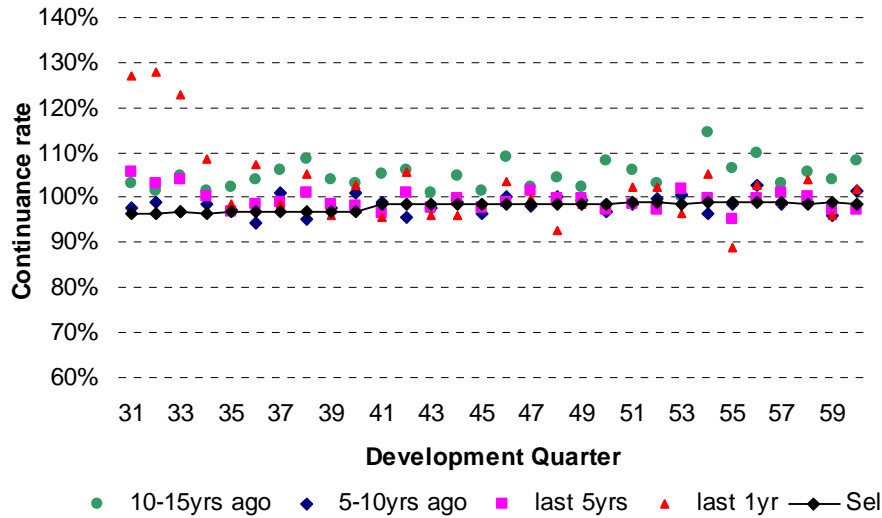


The chart above indicates that continuance rates for the early development quarters have trended down over time for delay quarters 1 to 12. Later delay quarter rates have increased in the last five years. As for most other benefit types, the continuance rates tend to increase from a low point in the earliest delay quarters.

The PwC selections for delay quarters 1 to 12 seem reasonable. The selections for delay quarters 13 to 30 seem low relative to recent experience, where rates nearer or above 100% seem justified.

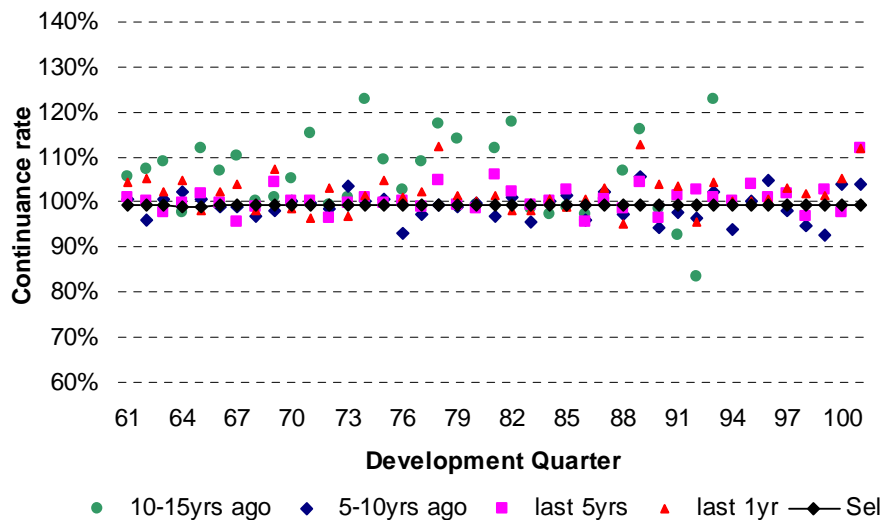
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**Figure O.2 - Continuance rates for delay quarters 31-60, all accounts**



The experience shown in Figure O.2 is volatile but flat over the development quarters shown. There is a clear decrease in continuance rates from the period 10-15 years ago to later periods. The PwC selections seem broadly reasonable.

**Figure O.3 – Continuance rates for delay quarters 61 and later, all accounts**



Similar comments for Figure O.2 apply to Figure O.3 above. The selected rates appear to be broadly reasonable.

### PPACs

The following charts show the PPAC assumptions for the same development quarter groupings as for continuance rates above, across all accounts.

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**Figure O.4 - PPACs for delay quarters 1-30, all accounts**

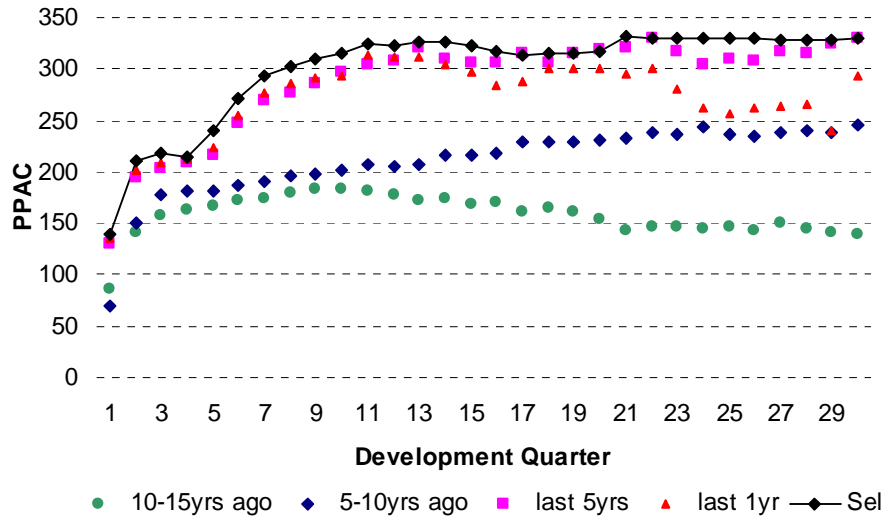
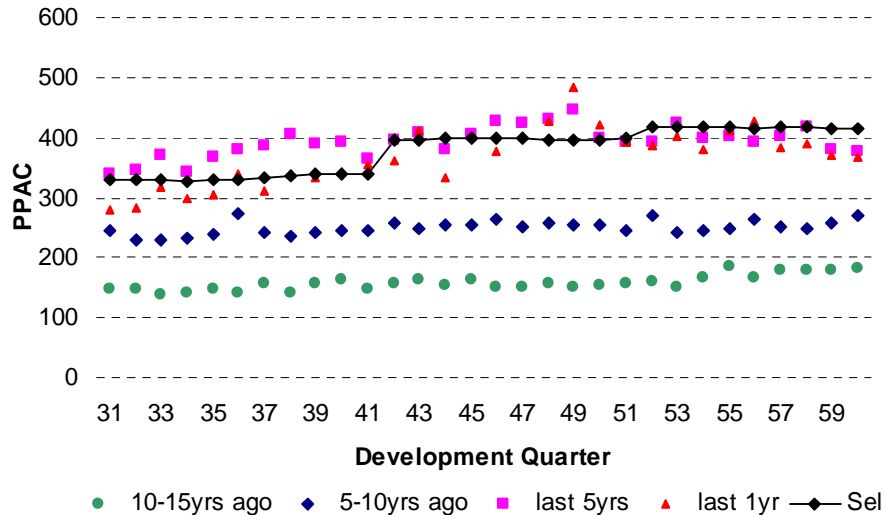


Figure O.4 illustrates both a changing shape and a higher level of PPACs over time over these delay quarters.

The PwC selections seem reasonable, responding to changing experience. The selections are perhaps slightly prudent compared to the last year's and last five years' experience.

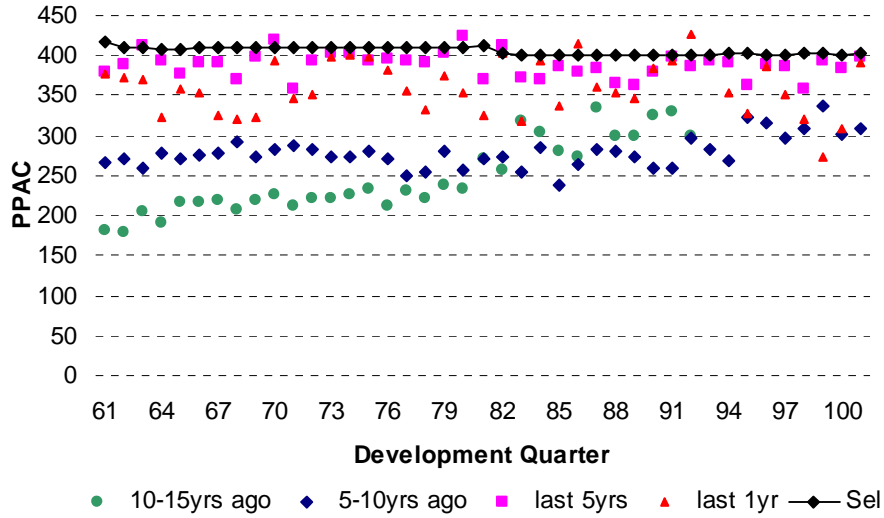
**Figure O.5 – PPACs for delay quarters 31-60, all accounts**



Referring to Figure O.5, the PPACs are stable by delay quarter but have clearly shifted up over time. The PwC selections are reasonable.

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Figure O.6 – PPACs for delay quarters 61 and later, all accounts

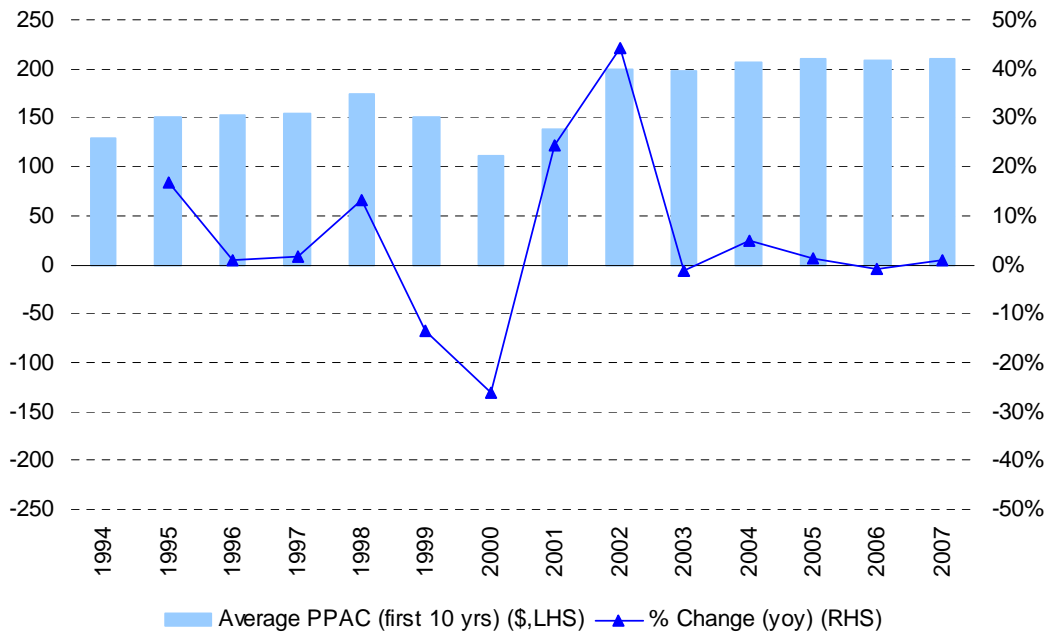


Similar comments apply for Figure O.6. The level of PPACs has shifted up over time. The PwC selections seem reasonable when compared to the last five years' experience.

### Superimposed Inflation

The following chart shows the average inflation-adjusted quarterly PPAC within a financial year for payments made in the first 10 years after accident, across all accounts.

Figure O.7 – PPACs by payment year (first 10 years), all accounts



If we measure superimposed as being the increase in the PPACs above, then superimposed inflation was:

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- 5% p.a. over the entire period shown
- 1% in the last five years.

PwC selected rates of 7.0% p.a. for 2008, 5.0% for 2009 and 2.5% p.a. for later years. These selections seem reasonable. We suggest that PwC provide greater disclosure of their justification for the high superimposed inflation assumption in 2008.

#### **O.4 Conclusions**

PwC's projection of the outstanding claims liability for Other Medical benefits as at 30 June 2008 is \$811 million, compared with the projection from 30 June 2007 of \$821 million. The decrease of 1% in the estimate is modest.

Based on our review we conclude that the methodology, assumptions and liability estimate for the Other Medical benefits are reasonable.

#### **O.5 Recommendations**

None.

## P Ambulance and Bulk Billed Costs

Certain health care costs are bulk billed to ACC, and paid shortly after receipt. These costs relate to pharmaceuticals, complex burns, laboratory costs, public health acute services and ambulances.

The projected 30 June 2008 outstanding claims liability projected from 31 December 2007 for Ambulance and Bulk Billed Costs is \$22 million. The table below shows a split by account.

**Table P.1 – 30 June 2008 Ambulance and Bulk Billing from 31 December 2007 (\$m)**

Account	Total	%
Employers	1	5%
Residual Work	0	0%
Partnership Program	0	0%
Self Employed	0	1%
<b>Total Work</b>	<b>2</b>	<b>7%</b>
Earners	4	18%
Residual Non Work	0	0%
<b>Total Earners</b>	<b>4</b>	<b>18%</b>
Treatment Injury	0	1%
Motor Vehicle	3	14%
Non Earners	13	60%
<b>Total</b>	<b>22</b>	<b>100%</b>

The estimated liability is almost unchanged from the previous review.

### P.1 Uncertainty

The nature of the payments included for this payment type means that the uncertainty in the liability estimate is small relative to the other payment types.

### P.2 Conclusion

Because this payment type only includes claims that are paid and reported quickly we believe that the approach adopted is reasonable.

Based on our review we conclude the liability for this benefit is not unreasonable.

### P.3 Recommendations

None.

## Q Claims Handling Expenses

PwC estimate claim handling expenses as a proportion of future claim payments. Separate assumptions are made by category of expense, account and duration since injury.

The projected 30 June 2008 outstanding claims liability projected from 31 December 2007 for Claims Handling Expenses is \$1,039 million. The table below shows a split by account.

**Table Q.1 – 30 June 2008 Claims Handling Expenses from 31 December 2007 (\$m)**

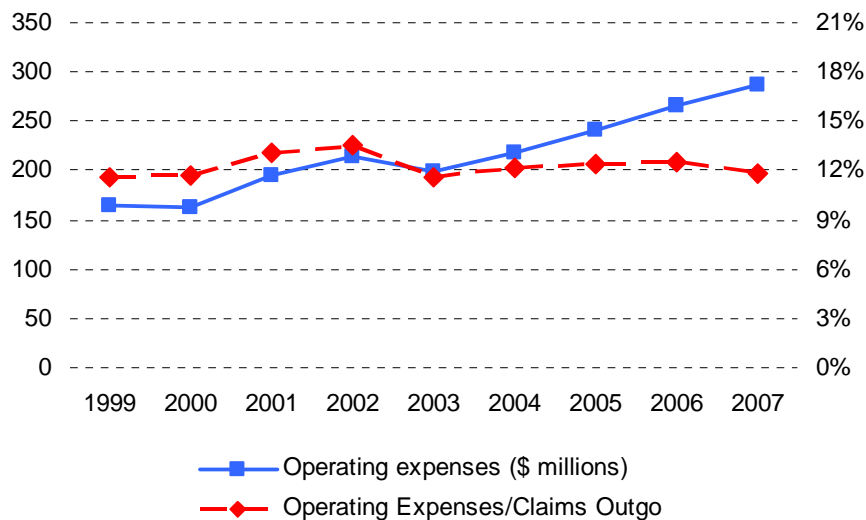
<b>Liability at 30 June 2008 from Dec 07 - Lump Sums</b>	
Account	Total
Employers	89
Residual Work	179
Partnership Program	8
Self Employed	23
<b>Total Work</b>	<b>298</b>
Earners	161
Residual Non Work	92
<b>Total Earners</b>	<b>253</b>
Treatment Injury	56
Motor Vehicle	327
Non Earners	104
<b>Total</b>	<b>1,039</b>

The estimated liability is has increased by approximately 2.4% since the previous review.

### Q.1 Experience

Figure Q.1 below shows ACC’s total operating expenses for the period 1999-2007. The dotted line shows operating expenses as a proportion of benefit paid (compensation plus lump sum). The amounts are taken from ACC annual reports over the period.

**Figure Q.1 - ACC Total Operating Expenses (\$ millions)**



The chart shows that the average annual increase in total expenses was 7% per year over the period 1999-2007. The annual increases have been higher than average in more recent

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years, typically 10% per year for the period 2003-2007. Operating expenses as a proportion of claims outgo has been reasonable stable over the period.

Note that only a proportion of ACC's total expenses will be attributable to paying claims arising from previous accident periods. It is only this proportion of expenses that is relevant to the assessment of the claim handling expense liability. Part of ACC's expenses in any year will relate to new claims, and other costs not relating to the payment of claims. It is possible that the proportion of expenses that are in respect of prior accident years may have changed over time. However, Figure Q.1 is useful because it considers changes in ACC expenses over a number of years.

Section 24.4 of the PwC report includes a chart of projected future expenses, both in total and as percentages of the estimated claim payments. The charts indicates that:

- Expenses as a proportion of claim payments are expected to continue at similar levels to the recent past. This is consistent with the relationship shown in the above chart.
- Expenses in absolute terms are expected to increase. However, the rate of increase over the period 2008-2010 is expected to be less than have been experienced in recent years.

An alternative basis of projection would be to assume that the rate of increase in expenses continues at the same rate as in recent years. However, PwC's assumptions are not unreasonable. The increase resulting from a change in method is not expected to be material in the context of ACC's total liabilities.

## **Q.2      Uncertainty**

Some of the factors that would cause the liabilities to deteriorate would also cause an increase in claim handling expenses. For example, an unanticipated increase in claim numbers could increase both the level of future benefit payments and the associated claim handling expenses. However, other causes of potential deterioration in benefit costs would not be expected to cause a significant increase in claim costs. For example, a reduction in discontinuance rates or an increase in average claim sizes would not necessarily result in significant extra expenses being occurred. In addition, claim handling expenses are only a small proportion of ACC's total outgo. Therefore the uncertainty in estimated claim handling expense amounts is small relative to the uncertainty in other payment types.

## **Q.3      Conclusions**

Based on our review we conclude the methodology employed and the liability for this benefit are not unreasonable.

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#### **Q.4 Recommendations**

None.