Institute of Actuaries of Australia

Superimposed Inflation – Australian Accident Compensation Landscape in 2007

Prepared by Estelle Pearson, Chas Beynon

Presented to the Institute of Actuaries of Australia
XIth Accident Compensation Seminar 1-4 April 2007
Grand Hyatt Melbourne, Australia

The Institute of Actuaries of Australia
Level 7 Challis House 4 Martin Place
Sydney NSW Australia 2000
Telephone: +61 2 9233 3466 Facsimile: +61 2 9233 3446
Email: actuaries@actuaries.asn.au Website: www.actuaries.asn.au

Superimposed Inflation – Australian Accident Compensation Landscape in 2007

1. Summary 1

2. Challenges of Superimposed Inflation 3

3. Superimposed inflation studies 7

4. Superimposed Inflation Survey 21

1. Summary

Aims

The aim of the SI Working Group was to paint a picture of the superimposed inflation landscape for Australian accident compensation schemes in 2007.

With this aim in mind we undertook the following work –

- a search of publications on the topic of superimposed inflation in order to present the issues and challenges facing the actuary and others when grappling with this difficult topic
- presentation of the results of two past Australian and one international study of superimposed inflation to indicate the varied nature of the causes of this phenomenon
- two brief case studies – one of WA workers compensation in the late 1990s and the other of NSW CTP in the 1990s – to provide further information on the reasons and consequences of superimposed inflation in these two environments
- a survey of Australian accident compensation schemes and a number of actuaries on their current views of superimposed inflation.

This paper is not intended to be technical in nature but rather look at the "big picture" so that a better understanding of the issues involved can be arrived at. Any reader expecting mathematical formulae will be disappointed, there are none.

Conclusions

From the work we have undertaken and particularly the survey results we conclude that there is general agreement that –

- superimposed inflation does exist!
- current levels of superimposed inflation are low but there is ample evidence from past experience that it can reach high levels which have potentially severe financial consequences
- the most effective "cure" (at least in the short term) for superimposed inflation is to change the benefits available to injured people. But care needs to be taken that this does not have unforeseen consequences
- the causes of superimposed inflation are varied and involve complex behavioural, social, legal and legislative forces
- scheme managers/regulators and actuaries have a good understanding of what superimposed inflation is, though other stakeholders have little understanding (but note that the survey was directed at scheme managers/regulators and actuaries!).

Superimposed inflation, as measured by actuarial models, is often the "balancing item" between what can be explained by the model and what cannot. This means that the existence or level of superimposed inflation can be masked by the model being used. It also leads to the somewhat confusing and potentially unhelpful situation where different models provide different measures of superimposed inflation.

As data quality has improved and computing power improved, Actuaries are building more sophisticated models of the experience with more parameters and potentially greater explanatory power. Hopefully these models will give us greater insight into the causes of past Superimposed Inflation.

In the extreme, the Actuary may build a perfect model of the past experience where past Superimposed Inflation has been fully parameterized in the model. Does this mean that Superimposed Inflation no longer exists? Of course not, it is just "hidden" in the model parameters such as propensity to receive a certain head of damage or effectiveness of new legislation. Where there is a trend in these parameters the Actuary still needs to make a judgement about the extent and duration of the trend into the future.

A number of the actuaries in the survey noted that understanding the causes of past Superimposed Inflation was more of a pre-requisite to making sound projections of the level of future Superimposed Inflation than precise measurement of past levels. This was echoed by one of the scheme respondents who noted that general statements about the level of superimposed inflation were unhelpful in deciding what management response was required to a deteriorating performance.

We believe that more thought is needed on how actuaries allow for future Superimposed Inflation. There seems to be some actuarial discomfort in the current method of allowing for a flat rate over all years, but also some concern about the difficulties of using differentiated rates. In reality Superimposed Inflation is erratic and happens in bouts which means that even if our long term single rate is correct our "allowance" will be released to profit for most years and be inadequate when the bout occurs (hopefully when this happens capital and risk margins will be sufficient to prevent ruin).

Given that we are currently in a low superimposed inflation environment, it is an opportunity for actuaries to equip themselves through better models and investigation techniques to work with scheme managers and regulators to have an effective response to the next bout of superimposed inflation.

2. Challenges of Superimposed Inflation

Superimposed inflation must be a perplexing concept for those not intimately involved in the insurance and accident compensation areas (and for many who are). It is most often described as the increase in personal injury claims costs above some "normal" level of inflation. Its measurement depends on the definition used of normal inflation as well as the actuarial models used to analyse and project claims experience. Different models can result in the measurement of different rates of past superimposed inflation and potentially different rates of future assumed superimposed inflation!

To make measurement even more problematic we generally agree that superimposed inflation is erratic and happens in bouts. So even accurate measurement of past superimposed inflation can be of little help or relevance as to what the level of superimposed inflation will be in the future. For example, it is unlikely that very high levels of superimposed inflation can be sustained indefinitely since this will cause system "collapse." Intervention of some type to arrest and reverse the superimposed inflation is likely and history tells us that this will occur.

Greg Taylor covered the topic well in a guest editorial to the British Actuarial Journal in 2002. He considered the dilemma faced by the actuary charged with setting reserves and prices in the face of a bout of undisputed past superimposed inflation

"The two forces bearing on this situation generate my conundrum in the form of two questions:

- *Is it in any way reasonable to damage an insurer by carrying out financial forecasts on the basis of an extrapolated trend when one can fairly confidently assign it a probability of virtually zero?*
- *In the absence of any clear guidance as to when and how that trend will be interrupted, how is one justified on any lesser forecast?*

I do not have an answer to these questions"

In any event the poor actuary is always doomed to get it wrong since we typically model future superimposed inflation as an expected average long term rate. Our models are destined to project too high amounts of superimposed inflation in most years and woefully inadequate levels in a few.

The dangers of superimposed inflation

The dangers of superimposed inflation and particularly in not recognising that superimposed inflation exists were described in an article by Ben Zehnwirth, Julie Sims and Mark Shapland published in Contingencies January/February 2004. They warned

"Unrecognised inflationary trends dangerously consume capital exponentially. While economic inflation is generally obvious, "superimposed" or "social" inflation, can go unrecognized for many years. This overlooked and critical characteristic often leads to chronic and massive under-reserving and under-pricing. More important, we believe that unrecognized inflationary trends have been a principal driver of the collapse of many insurers"

Geoff Atkins in his paper "The Role of Modelling Long Tail Classes of Business Risk in Managing Capital" presented at the Aon Re Conference "Enhancing Shareholder Value

Through Capital Risk Management" held in 2001 also dealt with the capricious nature of superimposed inflation and its adverse consequences.

"There are important behavioural forces (both social and legal) that drive (long tail) claims experience and that are systemic. The incidence of these behavioural forces is erratic in nature with periods of relative stability followed by sudden extreme changes, which have the potential to severely damage the insurer's financial position. In Australia this systemic risk tends to be labelled as the ubiquitous "superimposed inflation". The forces that influence claims costs generally affect all existing unpaid liabilities rather than just future claims. Anything driving up claims costs thus has a leveraged effect on solvency, annual profit and required premium rates."

Arguing about superimposed inflation

The difficulties already alluded to provide fertile ground for arguments about what the "right" level of superimposed inflation is. This can lead to tensions between actuaries and between actuaries and other stakeholders in insurance and accident compensation systems.

The Law Society of NSW were critical of analysis of superimposed inflation in common law workers compensation claims undertaken by PwC in 2001 noting in their submission to WorkCover NSW –

"The PwC Report's claim that the average claim size of the largest 20 settlements demonstrates the existence of superimposed inflation for Common Law matters is misleading. The largest 20 settlements represent a small proportion of the total number of claims, and as such appear to be statistically insignificant"

A major reason that the KPMG Actuaries assessment of James Hardie's asbestos liabilities for the Medical Research and Compensation Foundation at June 2003 was $1,573 million rather than the $1,090 million amount estimated at the time by Trowbridge Consulting was because of an additional $365 million for superimposed inflation included in the KPMG assessment.

The level of superimposed inflation was also argued at the HIH Royal Commission.

We found references from both the WorkCover Tasmania Board and Queensland Motor Accident Commission on the large range of views of insurers about the level of future superimposed inflation that should be included in premiums.

Will improved actuarial modelling help resolve the arguments about superimposed inflation? Andrew Smith and Mitch Prevett's presentation at the IAA Reserving for General Insurer Seminar held in September 2006 "Stochastic Reserving Methods" noted that one advantage of stochastic reserving is that statistical significance can be used to determine if superimposed inflation trends are "real." However, the presentation also noted that this did not necessarily resolve the question of the cause of the superimposed inflation. Neither does it resolve the question of what rate of future superimposed inflation should be used.

Our view is that even if actuaries get better at measuring past superimposed inflation, the arguments about the correct allowance for future superimposed inflation will continue.

Guidance and requirements of actuaries

Despite the definitional, measurement and projection issues, superimposed inflation is deeply embedded in the regulatory, actuarial and accounting regimes in Australia.

APRA's GPS310 governing liability valuations for general insurers states -

"Appropriate allowance must be made for claims escalation when determining the central estimate of both outstanding claims liabilities and premiums liabilities. Future payments may increase over current levels as a result of wages or price increases (inflation) and/or court-awarded interest, other environmental or economic causes (superimposed inflation), and appropriate allowance must be made for this."

The Institute of Actuaries of Australia's PS300 is similarly worded although the term superimposed inflation is interestingly omitted although alluded to.

"Future claim payments may well be greater, as a result of wage or price inflation, court decisions or other economic or environmental causes, than current payments for similar claims. Such factors should be allowed for when estimating liabilities."

The Accounting Standard AASB1023 is explicit about superimposed inflation stating

"The expected future payments are estimated on the basis of the ultimate cost of settling claims, which is affected by factors arising during the period to settlement such as normal inflation and "superimposed inflation". Superimposed inflation refers to factors such as trends in court awards, for example increases in the level and period of compensation for injury."

Other jurisdictions also require actuaries to at least think about superimposed inflation. The Singapore Actuarial Society Guidance Note G01 states

"3.3.4.1 Claim inflation may be incorporated into the estimates of outstanding claims liabilities either implicitly or explicitly. Where the model adopted requires an explicit assumption it may be useful to separate claim escalation into standard inflation and superimposed inflation.

3.3.4.3 Superimposed inflation should ideally be derived from an analysis of the insurer's own claims statistics. In smaller portfolios it may be difficult to be definitive as to the existence of superimposed inflation or its level. In such circumstances it is reasonable to give recognition to wider industry analysis or generally accepted views adopted by other actuaries"

The Swiss Association of Actuaries (Association Suisse des Actuaries) also deals with superimposed inflation in guidance to Swiss actuaries on Guidance on Loss Reserves in Non-Life Insurance.

"Price increases have a major influence on future claims payments. They can be taken into account implicitly or explicitly. Run-off triangles contain price increases observed in the past, which means that reserve calculations based on such triangles already implicitly contain price increases to the extent of the values observed in the past. When taking explicit account of price increases, it is advisable to distinguish between normal price increases due to economic variables like the consumer price index and superimposed inflation caused, for example, by changes in case law"

Overall we found far more Australian references to superimposed inflation than from other jurisdictions. This is probably due to the prevalence of chain ladder reserving techniques in the US and Europe compared with average payment reserving techniques used in Australia (rather than the absence of superimposed inflation in other jurisdictions!). The former do not differentiate between normal and superimposed inflation and so references tend to be to total claims cost escalation, particularly in the US. These methods also do not deal well with

payment period impacts like superimposed inflation. L.Hougaard-Hansen of the University of Copenhagen abstract of the paper "Stochastic Claims Reserving in General Insurance" noted the problems.

"Real life insurance data does simply not support the traditional models used for claims reserving (e.g. the Chain Ladder Model). What is needed is a paradigm shift for claim-reserving in general insurance. The form of this paradigm is still blurred. One factor, which is overlooked in the traditional models, is the effect of superimposed inflation. This effect is noticeable in data and can be captured in the so-called Probabilistic Trend Family framework"

In general, the history of using average payment reserving technologies should equip Australian actuaries to better deal with superimposed inflation than their US and European counterparts . These methods – despite their shortcomings – more explicitly identify payment period trends and enable explicit future allowance for superimposed inflation than chain ladder methods.

3. Superimposed inflation studies

We came across three publications examining and measuring superimposed inflation (two Australian and one international) and undertook two additional case studies of Australian accident compensation experience.

Greig Fester 1992 publication on large common law awards

Greig Fester commissioned Trowbridge Consulting to undertake an analysis of large court awards between 1973 and 1992. This analysis took place in an environment of concern over some large recent awards coming out of the courts.

The publication concluded.

"Common law awards made to seriously injured persons have exhibited significant levels of superimposed inflation over the last twenty years, mainly due to increases in the amounts awarded to cover the injured person's needs. This superimposed inflation is expected to continue and should be allowed for by insurers of personal injury liability portfolios. In addition, a new class of injury, the ventilator-dependent quadriplegic, has emerged. This has resulted in a significant jump in the size of the largest awards made."

The publication noted also

"While the trend in these awards would not be expected to represent precisely the trends in all bodily injury claims, awards made to the most seriously injured act as a barometer of the settlement climate, and also set precedents for other settlements. As a result any trends in the largest awards would be expected to filter through to other awards, with the effect being dampened as the awards become smaller"

Trends in Large Common Law Personal Injury Claims, Gae Robinson and Gillian Harrex, 2003

This paper was presented to the XIV Accident Compensation Seminar in November 2003. The findings of the paper were.

"The largest court awards made for personal injury over the last decade have been at historically high levels. The highest award made in each year has averaged $11.2 million in the ten years to 2002, compared with $4.3 million in the previous ten years. Factors leading to higher awards in the last ten years include:

- *Improved survival of more seriously injured individuals*
- *Expansion in the heads of damage awarded and the elements of loss compensated; the compensation better reflects the true needs of the individuals*
- *Unusual individual circumstances, in some cases.*

Examination of the largest CTP claims paid over the same ten years (NSW, Qld and WA data combined) indicates that superimposed inflation has been running at what would be considered "normal" long term levels of 3-6% per annum."

Swiss Re European Motor Markets, 2003

This publication contains an analysis of superimposed inflation for motor vehicle third party liability clams involving a high level of disability and requiring a high degree of care. A benchmark case is taken and measured over three periods of time 1990, 1998 and 2003. Superimposed inflation is defined as the difference between the increase in the benchmark case and the average wage/salary increase. The results of the study are summarised in the table below.

Country	SI(pa)	Causes
Czech Republic	2%	Increased pain and suffering payments in the 1998 to 2003 period
Denmark	2%	Change in legislation in 2002 which increased loss of earning payments (note that in Denmark virtually all care or assistance payments are met from the social security not the insurance system)
Finland	2%	Increase in care costs and loss of earning costs between 1990 and 1998 due to a decrease in the discount rate used to value annuities from 5% to 4% per annum
France	4%	Changes to the mortality tables and a reduction in the discount rate from 4.75% to 3.5% per annum for calculating annuities, in the period 1998 to 2003 the superimposed inflation was due to increased care costs with increases in the wages of care givers and an increase in the average number of carers
Germany	5%	Increased costs for pain and suffering, medical costs and long term care plus an increase in the parameters used to capitalise annuities in the 1998 to 2003 period
Italy	9%	Introduction of new tables to calculate danno biologico (the value of the accident victim as an individual within society) and danno morale (pain and suffering) during 1990 to 1993 plus an ongoing increase in care benefits
Norway	5%	Reduction of the share of loss of earnings paid by the social security system and an increase in assistance costs as well as the share of assistance costs paid by insurers and an increase in pain and suffering due to the introduction of a new compensation system
Poland	1.4%	Increased payments for pain and suffering
Sweden	0.4%	
United Kingdom	9%	Increase in care payments and new tables for capitalisation of annuities and a reduction in the discount rate from 4.5% to 3% per annum in the 1990 to 1998 period; in the second period there was a continued increase in care costs and a further drop in the interest rate for capitalising annuities to 2.5% per annum

Case study 1 – Superimposed inflation in the NSW CTP scheme in the 1990s

This case study looks – with the benefit of hindsight – at the impact of superimposed inflation on the NSW CTP scheme in the period 1990 to 1995. Because it is done on a hindsight basis the impact of superimposed inflation on accident year average claim size can be examined. Because superimposed inflation is a payment period impact then it has a bigger impact on those accident years which are less finalised when the superimposed inflation occurs.

The NSW scheme was privatised in 1989 under the Motor Accident Act 1988. The 1988 Act also introduced certain benefit restrictions, in particular the requirement for an injury to exceed 8% of a most extreme case to be eligible for a general damages amount.

The private sector insurers were at first allocated a random portfolio based on pre-agreed market shares and charged a common premium rate. From 1 July 1991, insurers commenced the process of determining competitive premium rates which had to be "fully funded" in accordance with the definition in the 1988 Act and filed with the Motor Accident Authority (MAA).

Early experience under the 1988 Act was much better than anticipated with frequency in particular being much lower than expected. Competition for market share was fierce and premium rates plummeted as insurers factored in lower claims costs.

It was only in around 1994 that insurers recognised that experience was deteriorating with claim frequency increasing and payments escalating. Premiums started to move up rapidly as insurers factored in higher frequency, higher average size and higher superimposed inflation.

The charts below demonstrate what happened at a total claim level.

Figure 1 – Claim frequency per 1,000 vehicles by accident year (1990 to 1995)

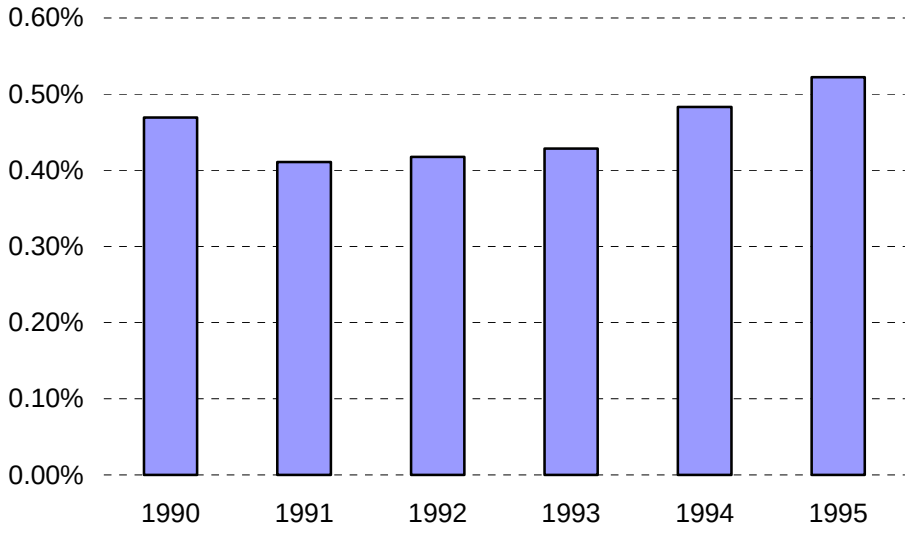
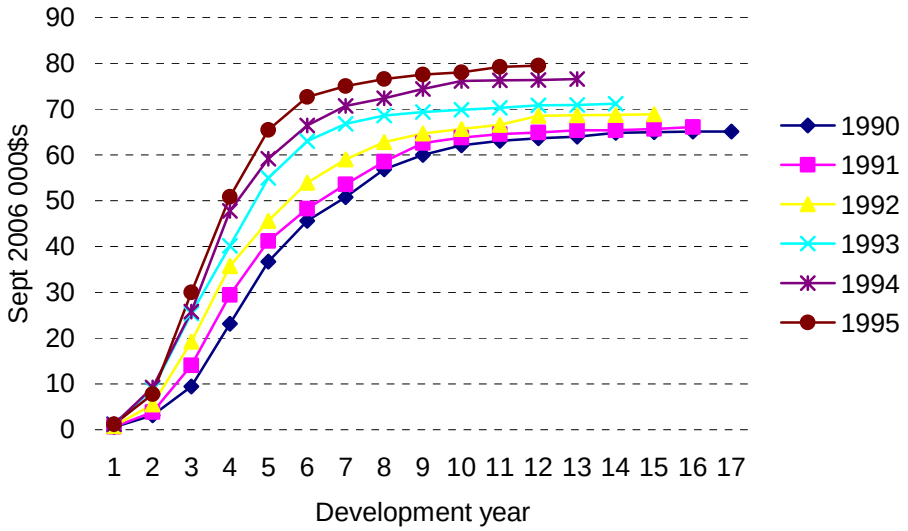


Figure 2 – Cumulative Payments per Claim Incurred by accident year (1990 to 1995)



The first chart shows that total claim frequency increased from just over 0.4% to over 0.5% over the two years 1993 to 1995, i.e. a 25% increase.

The second chart shows the cumulative payments per claim incurred (PPCI) for each accident year adjusted for wage inflation. With the benefit of hindsight and with only a trickle of payments now for these years we can measure that on an accident year basis the superimposed inflation which occurred in the mid 1990s resulted in an increase in the average size of claims from $65,000 for 1990 to $70,000 for 1993 and $80,000 for 1995, i.e. a total increase of 22% equivalent to 4% per annum.

The "shape" of the PPCI's also changed with a speeding up of total payments for the 1993 and later accident years. At development year 5 the cumulative PPCI for the 1995 accident year is close to double that for the 1990 year at the same age. This may have led to an overstatement in the measurement of the amount of superimposed inflation being experienced depending on the models being used by actuaries.

The next charts look at the same information but for injury severity 1 claims only.

Figure 3 – Claim frequency per 1,000 vehicles – Sev 1 claims by accident year (1990 to 1995)

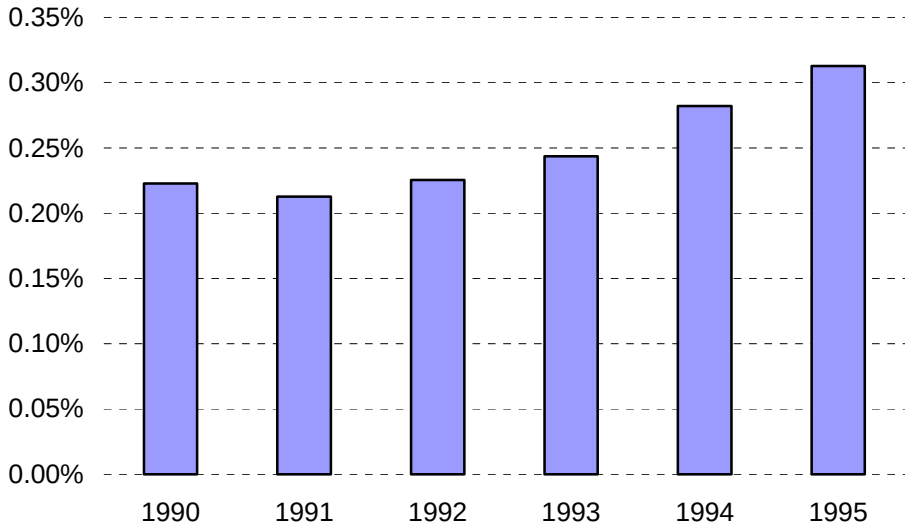
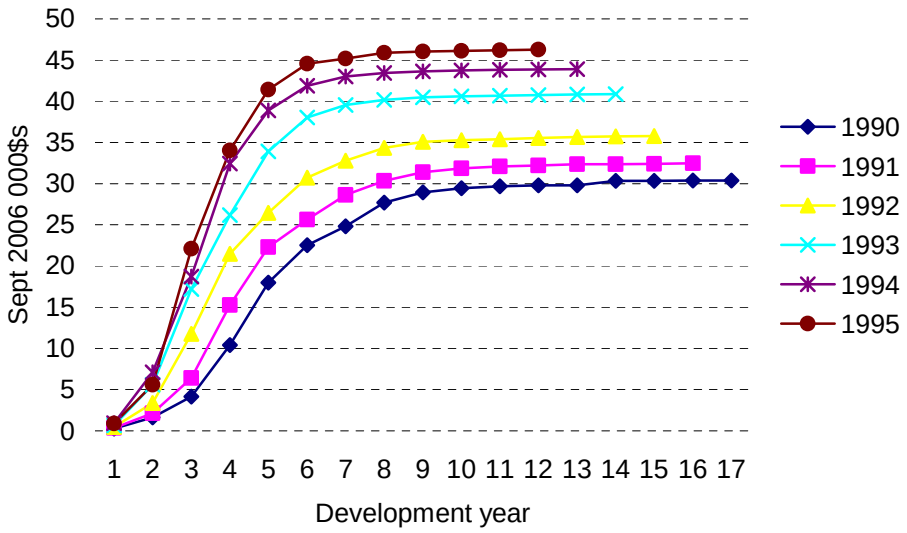


Figure 4 – Cumulative PPCI – Sev 1 claims by accident year (1990 to 1995)



Claim frequency for severity 1 claims increased from 0.22% in 1992 to over 0.3% in 1995, almost a 40% increase. Cumulative payments per claim incurred increased from $30,000 for the 1990 accident year to over $45,000 for the 1995 accident year, an increase of over 50% equivalent to 9% per annum.

The next charts show the same information for severity 3+ claims.

Figure 5 – Claim frequency per 1,000 vehicles – Sev 3+ claims by accident year (1990 to 1995)

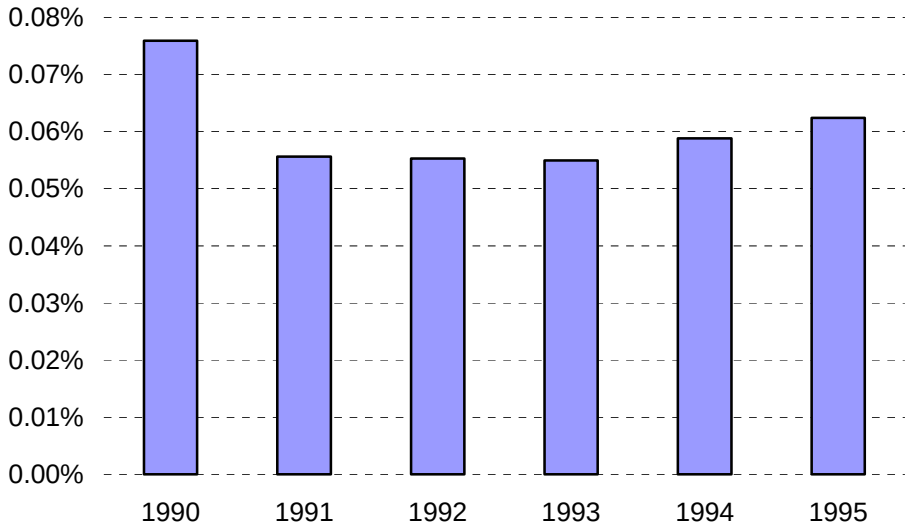
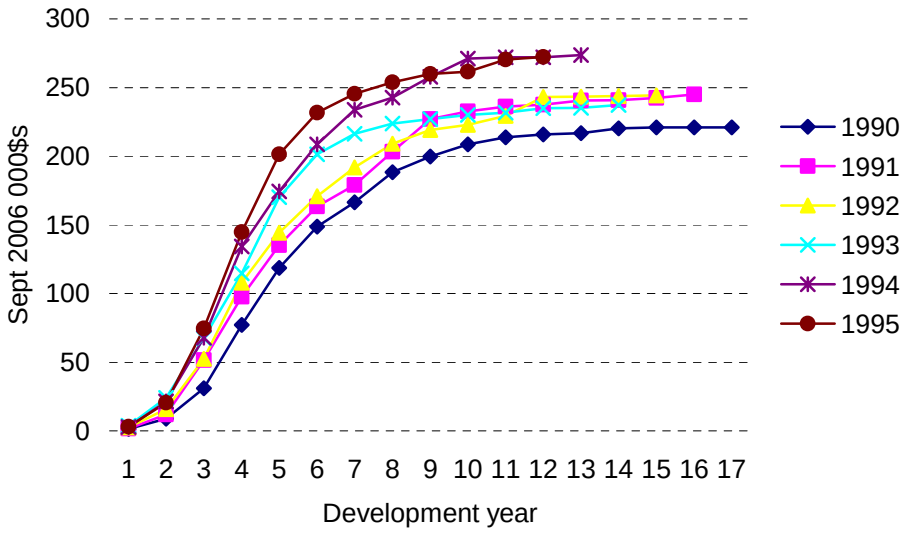


Figure 6 – Cumulative PPCI – Sev 3+ claims by accident year (1990 to 1995)



Claim frequency increased by 14% between 1993 and 1995. Cumulative accident year payments per claim incurred increased from $220,000 for 1990 to around $250,000 for 1991 to 1993 and over $270,000 for 1994 to 1995.

This information shows that while superimposed inflation was present in claims at both the low and higher severity levels, the lower severity claims experienced higher superimposed inflation and higher claim frequency increases.

Analysis at the time suggested strongly that the deteriorating claim experience was being driven by an erosion of the threshold for general damages with a higher proportion of claims receiving a general damages award year on year.

The following charts show the cumulative accident year PPCIs for each of general damages, economic loss, medical and legal and investigation payments. In each case the denominator used is the total number of claims whether or not they received the particular head of damage. Therefore both changes in the propensity for claims to receive a head of damage and the average amount paid for that HoD are captured but not separately identified.

Figure 7 – Cumulative GD PPCI – Total claims by accident year (1990 to 1995)

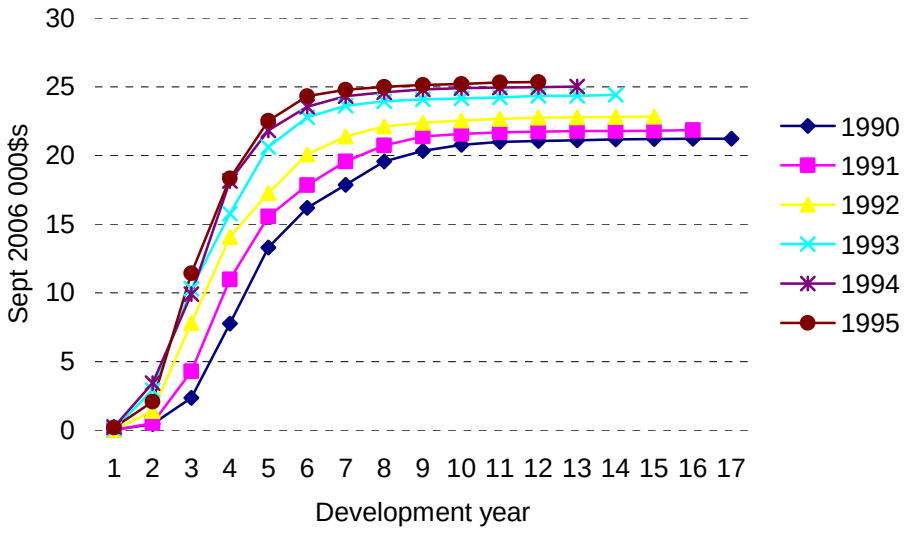


Figure 8 – Cumulative EL PPCI – Total claims by accident year (1990 to 1995)

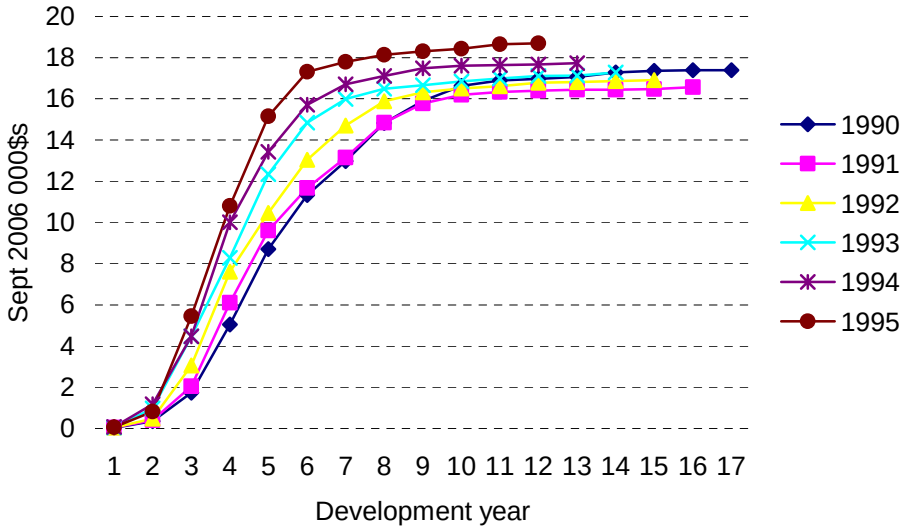


Figure 9 – Cumulative Med PPCI – Total claims by accident year (1990 to 1995)

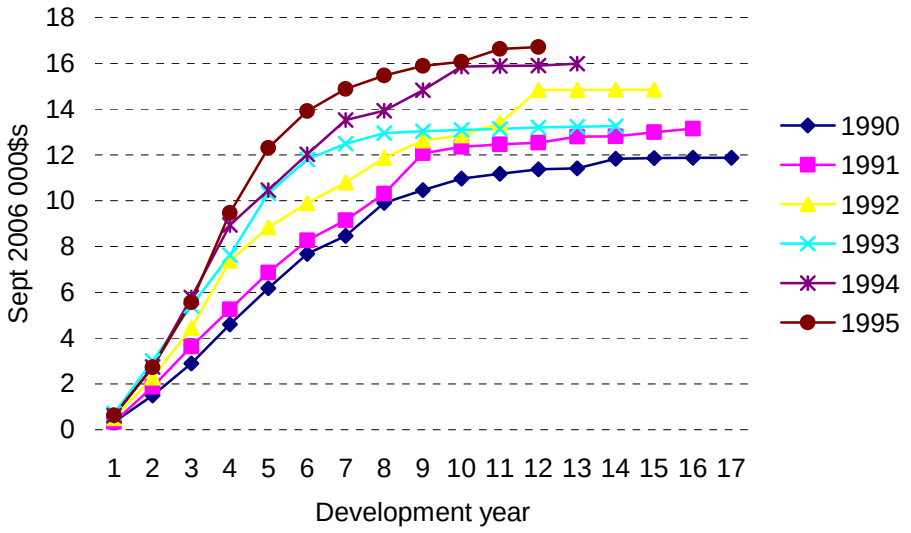
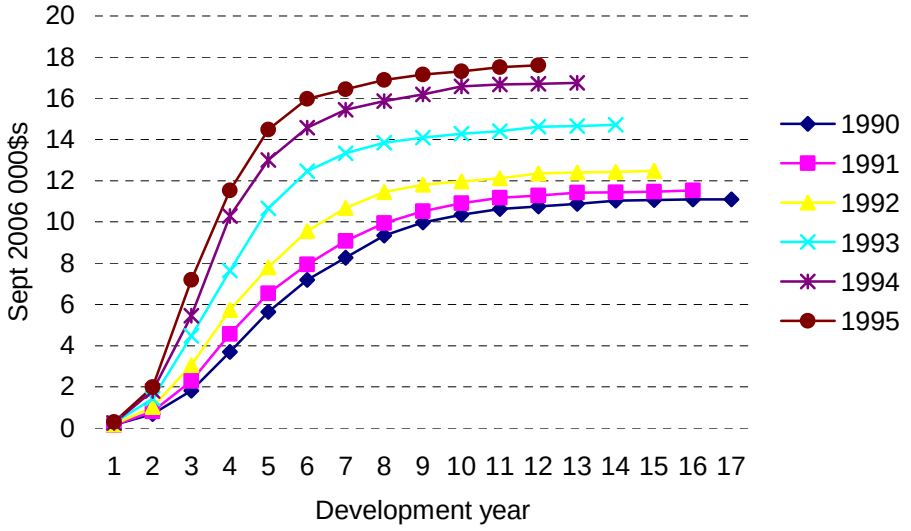


Figure 10 – Cumulative Legal & Inv PPCI – Total claims by accident year (1990 to 1995)



The following table summarises the 1990 and 1995 accident year cumulative PPCIs for each HoD.

Table 1 – Cumulative PPCIs by HoD – All claims

	1990	1995	Change
General Damages	21,208	25,344	120%
Economic loss	17,390	18,687	107%
Medical costs	11,876	16,711	141%
Legal and Inv	11,096	17,612	159%

While all HoDs increased, the biggest increases were in legal and investigation costs and medical costs. Of course looking at this same information by severity level may give some different outcomes.

The same charts are repeated for severity 1 claims.

Figure 11 – Cumulative GD PPCI – Sev 1 claims by accident year (1990 to 1995)

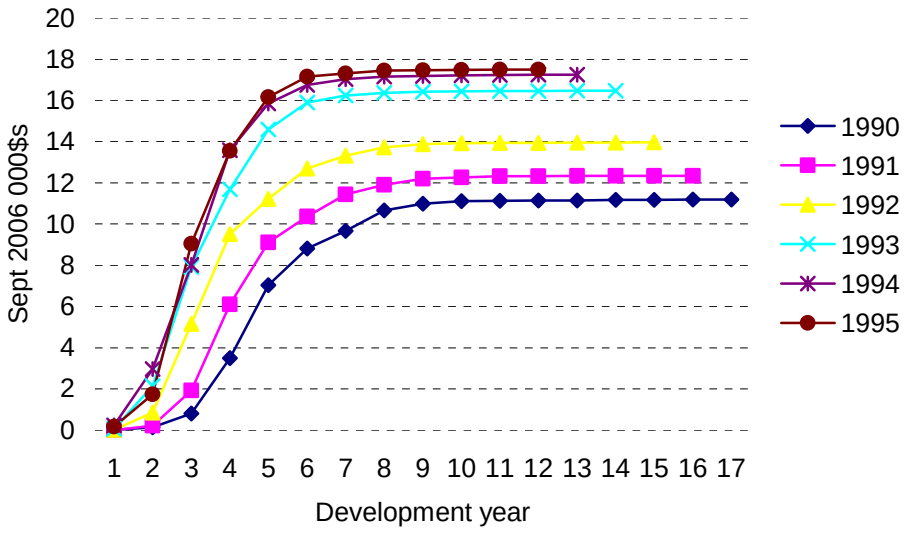


Figure 12 – Cumulative EL PPCI – Sev 1 claims by accident year (1990 to 1995)

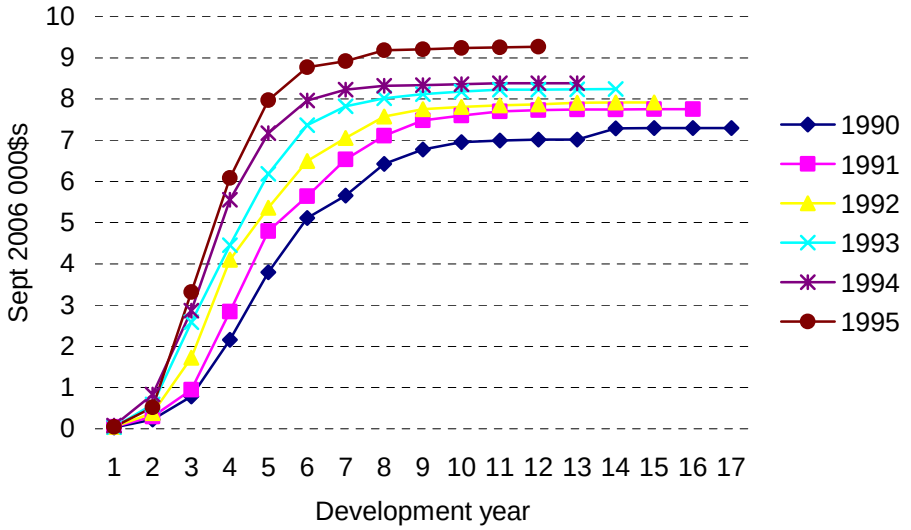


Figure 13 – Cumulative Med PPCI – Sev 1 claims by accident year (1990 to 1995)

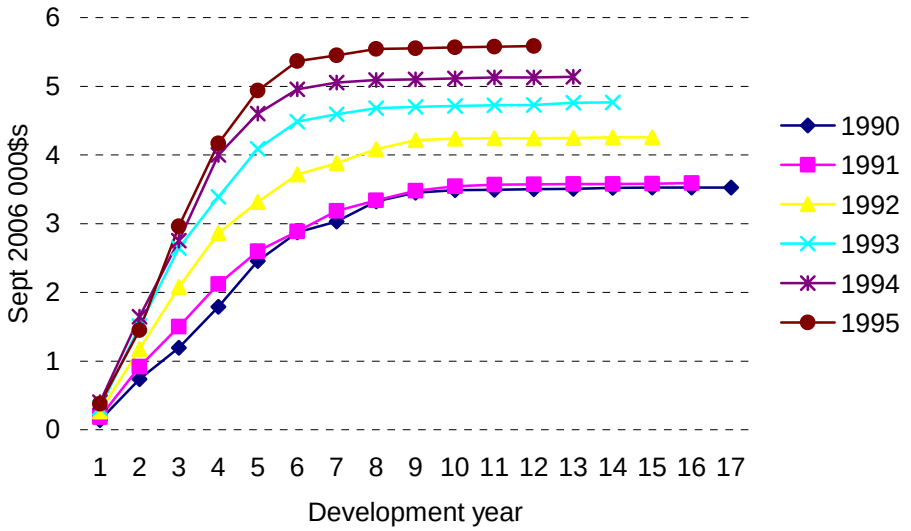
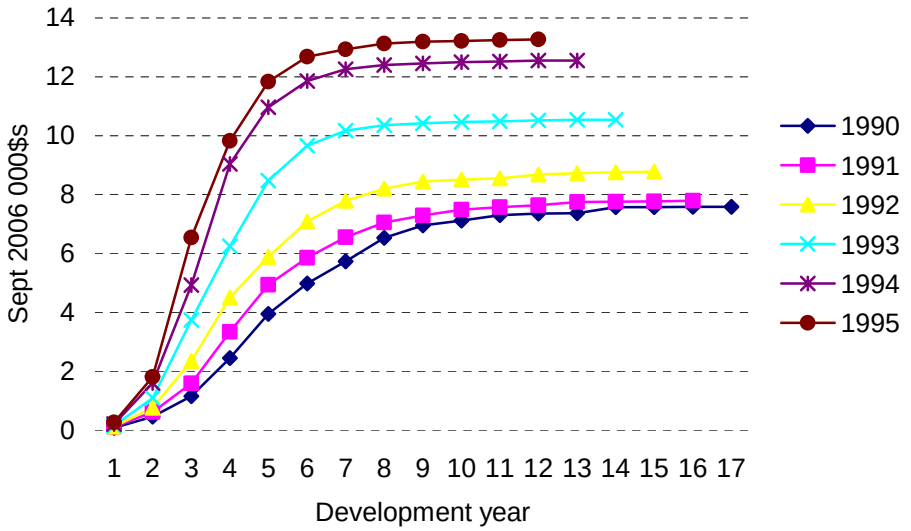


Figure 14 – Cumulative Legal & Inv PPCI – Sev 1 claims by accident year (1990 to 1995)



The outcomes in the graphs are summarised in the following table.

Table 2 – Cumulative PPCIs by HoD – Sev 1 claims

	1990	1995	Change
General Damages	11,181	17,496	156%
Economic loss	7,296	9,268	127%
Medical costs	3,525	5,587	159%
Legal and Inv	7,585	13,268	175%

Severity 1 claims had a higher level of increase for all HoDs than total claims, particularly for general damages and economic loss.

This hindsight analysis demonstrates that while superimposed inflation was in force across all claims and all heads of damage in this period increases in total claim cost were particularly driven by –

- Higher legal and investigation costs
- Higher medical costs
- Higher general damages amounts for less serious claims.

The higher benefits – particularly for the less serious claims appear to have led in turn to an increase in claim frequency.

Depending on the models being used at the time superimposed inflation may have been measured at higher rates than have actually emerged as there was a change in the payment pattern after the 1992 accident year with a higher proportion of payments being made earlier.

Case Study 2 - Superimposed Inflation in the Western Australian Workers Compensation Scheme in the late 1990's

Overview

In June 1993 legislation changes were made to the Western Australian Workers Compensation Scheme as a result of cost pressures on the scheme that were becoming evident at that time.

In particular these cost pressures were being driven by –

- Increase in the frequency of Common law claims leading to an increasing the cost of Common Law (the frequency as a percentage of all claims had doubled in less than 10 years.
- The increased propensity of insurers to offer lump sum redemptions.

The thrust of the changes was to contain Common Law and Redemption costs by:

- Reducing the potential for workers to make Common Law claims, and
- Place restrictions on lump sum redemptions.

Initially these changes appeared to work reducing overall costs to the order of 10% for the 1994 accident year.

However after a "honeymoon" period overall costs began to increase rapidly. This rapid increase commenced in the 1996/97 accident year where overall costs were 14% higher than the previous year.

This rapid escalation in costs led to further legislative changes in October 1999.

What Happened

Common Law

The changes to the legislation in June 1993 to reduce the potential for workers to make Common Law claims was done by setting thresholds for access to Common Law. These thresholds (Gateways) were as follows:

- **1st Gateway**
  Workers had to establish a 30% disability of the body as a whole.

- **2nd Gateway**
  If 1st Gateway threshold could not be established the worker had to prove that as a result of the disability their pecuniary loss was greater than the "Prescribed Amount". (the maximum total amount payable in weekly payments and lump sum settlements).

It was the 2nd gateway that was the main driver for the cost blow-out.

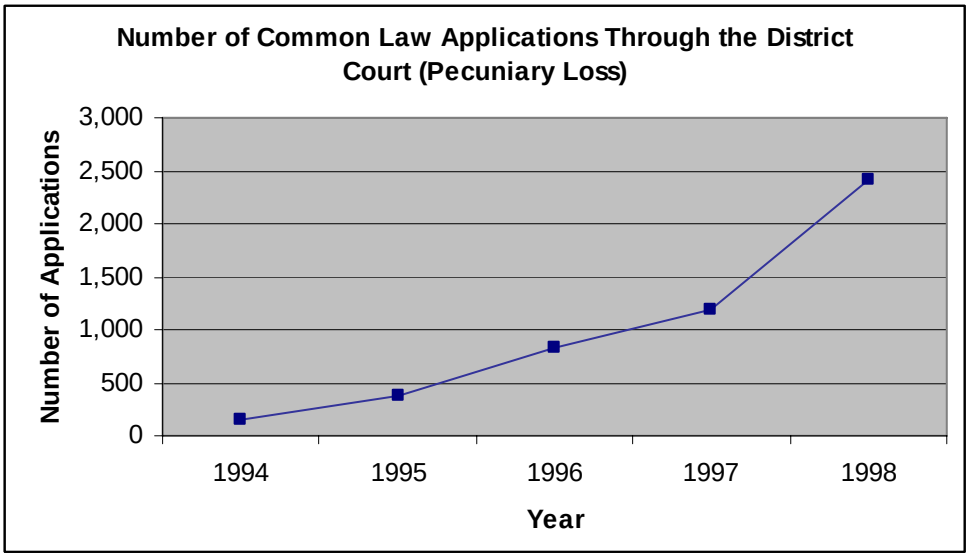
The 2nd gateway was a late inclusion to the amendments. It was not expected to add much to the overall costs as it was intended to be rarely used. An example of its intention would be in the case of a concert pianist who lost a finger.

In practice what happened was that District & Supreme Courts decisions gave an expansive and liberal interpretation to ***pecuniary loss***, which resulted in far more claims from this source than was the intention of the amendments.

In particular the Courts considered the timeframe for potential ***pecuniary loss*** to be the working lifetime of the claimant (to age 65), thus it became relatively easy to access Common Law through the 2nd Gateway, (even at relatively advanced ages) and for young claimants the level of loss did not have to be great.

Numbers of Common Law claims were soon back to pre-amendment levels but with a higher average cost.

The chart below is taken from the report "Workers' Compensation Western Australia The Last Decade" (Dr Rob Guthrie and Peter Lurie) presented at the X Accident Compensation Seminar in December 2004 and shows the increase in Common Law applications through the District Court over the period 1994 to 1998 from this source.



This rapid increase manifested itself as a sharp increase in superimposed inflation.

Restriction of Lump Sum Redemptions

Restriction of lump sum redemptions meant that for workers looking for lump sums access would be through Common Law. This resulted in an increased incentive to remain off work to validate their claim for ***pecuniary loss***.

This led to an increase in duration of weekly benefits and consequent increase in total costs above existing levels (increase in superimposed inflation).

Quantification of Level of Superimposed Inflation

Each year PwC carry out an assessment of scheme premium rates for the Premium rates Committee of WA

In their report for the 2000/01 year (the first full year since the 1999 amendments) they give an estimate of past levels of scheme Superimposed Inflation over the period 1991 to 1999.

These estimates are given for each of the models used, and are set out below:

Model	Estimate of Superimposed Inflation pa
PPCI	14.1%
PPCF	11.5%
PPCH	11.0%

This analysis also illustrates that as superimposed inflation is often defined as the amount that remains unexplained by the model (i.e. the balancing item) different models will give different estimates of Superimposed Inflation as they incorporate different information.

PwC's estimates for each of the models used, from their 2006/07 report, for the period ending 2005, are set out below:

Model	Estimate of Superimposed Inflation pa
PPCI	2.7%
PPCF	4.3%
PPCH	3.9%

This shows that the legislative changes in October 1999 appear to have worked and in fact recent changes have been made to increase the level of benefits in the scheme.

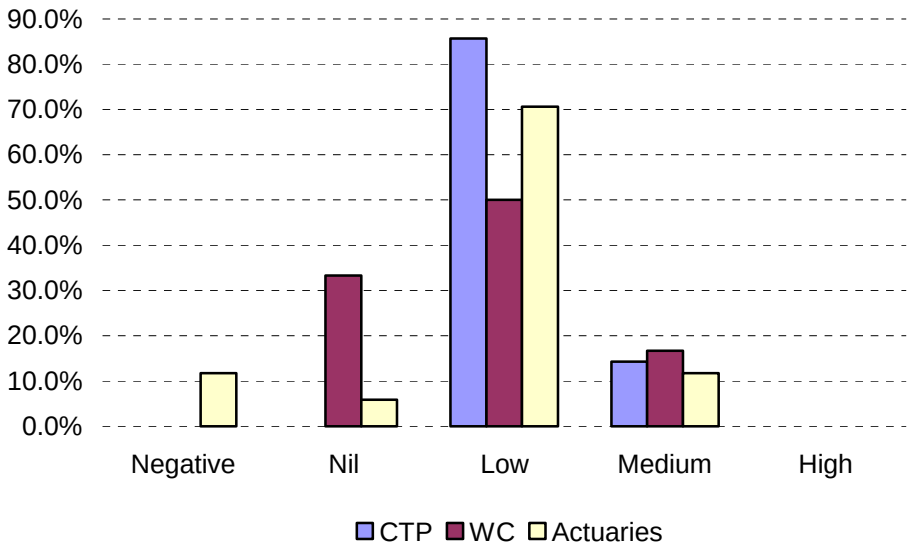
It should also be noted from the above that the relativities of the levels of Superimposed Inflation measured by the different models have also changed between the two periods, with the PPCI showing the greatest level in the pre 2000 period and the lowest level in the pre 2005 period.

This probably reflects that the "drivers" of Superimposed Inflation over the two periods are different and are picked up to a different extent by the respective models.

4. Superimposed Inflation Survey

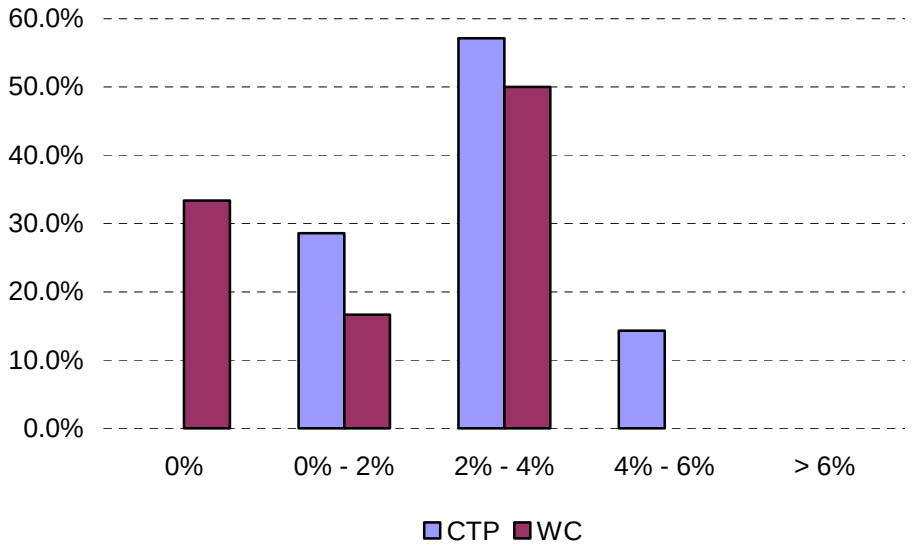
We conducted a survey of each of the accident compensation schemes in Australia as well as a number of "eminent" actuaries on their current views and attitudes to superimposed inflation. The following summarises the results of the survey.

In your opinion, what is the level of superimposed inflation currently being experienced in your scheme? Or for actuaries, in general what is the level of superimposed inflation currently being experienced in accident compensation schemes in Australia?



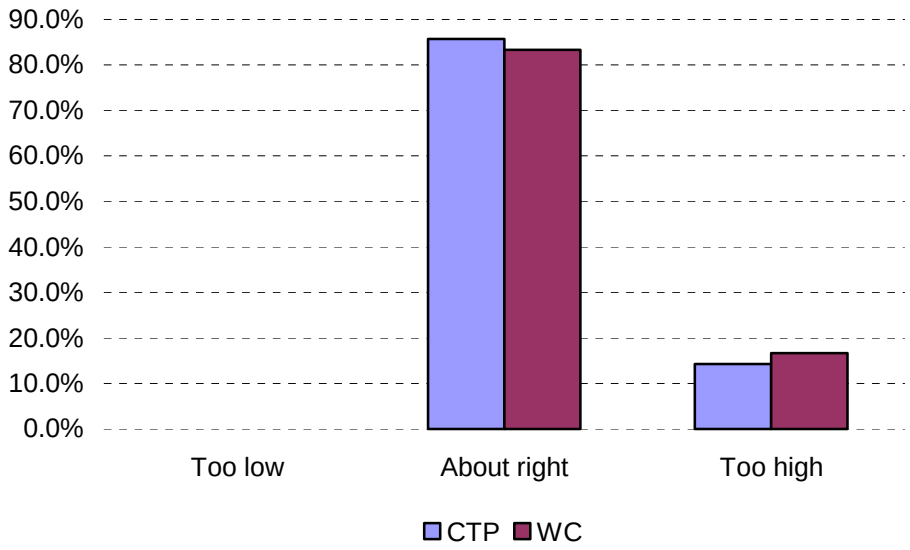
Around 85% of respondents in each category were of the view that current superimposed inflation levels were low, nil or (actuaries only) negative.

What level of superimposed inflation is included in the current premiums for your scheme? (Schemes only)



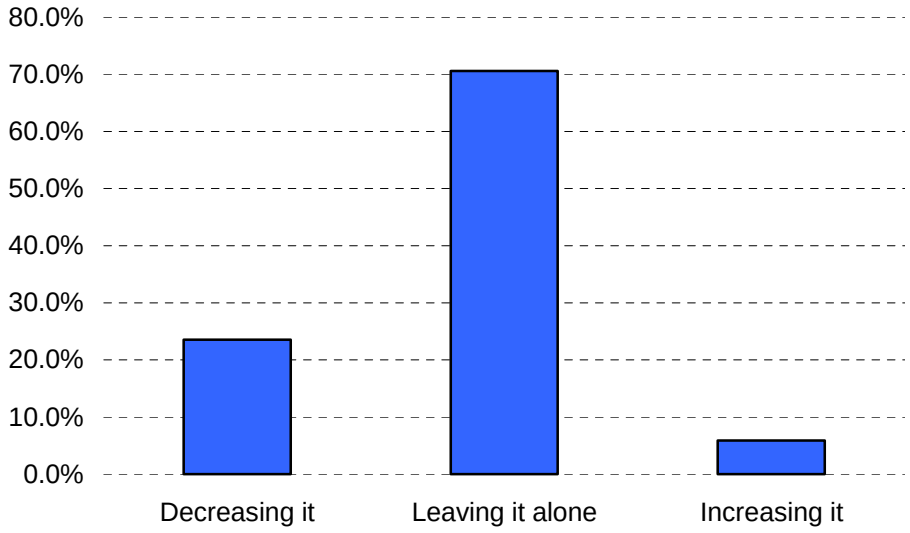
For the workers compensation over 30% of schemes had no allowance for superimposed inflation (not surprisingly given the nature of benefits). No workers compensation schemes had a superimposed inflation allowance of over 4% per annum. 85% of CTP schemes had a superimposed inflation allowance of between 0% and 4%. No CTP scheme had a nil superimposed inflation allowance.

In your opinion is the level of superimposed inflation currently being made in reserving and/or pricing for your scheme too low, about right, too high? (Schemes only)



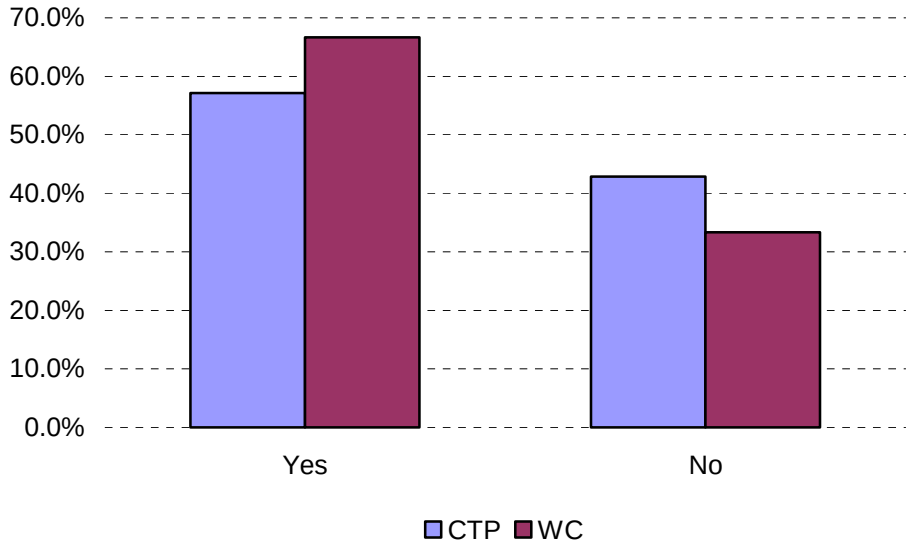
The majority of respondents viewed the current superimposed inflation allowance as about right. Between 10% and 20% of the CTP and workers compensation schemes viewed the allowance as too high, presumably this is linked to the observation of current low levels of superimposed inflation in the claims experience.

If you carry out claim cost projections (liability valuation or pricing) for accident compensation schemes what have you generally been doing with the superimposed inflation assumption in the last couple of years? (Actuaries only)



Most actuaries had not been changing their superimposed inflation allowances in the last couple of years despite observation of low superimposed inflation in the recent claims experience.

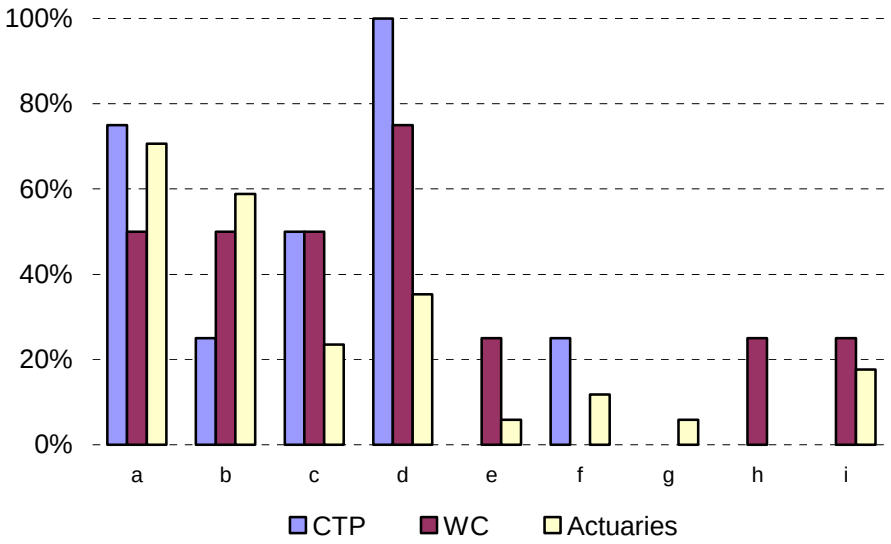
Has your scheme been subject to high levels of superimposed inflation in the past? (Scheme only)



Over half of both the CTP and workers compensation schemes had been subject to high levels of superimposed inflation in the past. This is despite the differences in the benefit regimes, i.e. the CTP schemes contain "pure" common law benefit structures whereas the workers compensation schemes are all no fault with statutory benefits and varying degrees of access to common law.

Where your scheme has been subject to high superimposed inflation in the past what made it stop? (Scheme) Where you have observed high levels of superimposed inflation in an accident compensation scheme in the past what made it stop? (Actuaries)

a. **Changes to benefits**
b. **Exclusion/limitation on participation of lawyers from the system**
c. **Changes to other aspects of the scheme**
d. **Changes to the management of claims**
e. **Changes to management**
f. **Changes to the actuarial models**
g. **It just stopped**
h. **It has not stopped yet**
i. **Other**

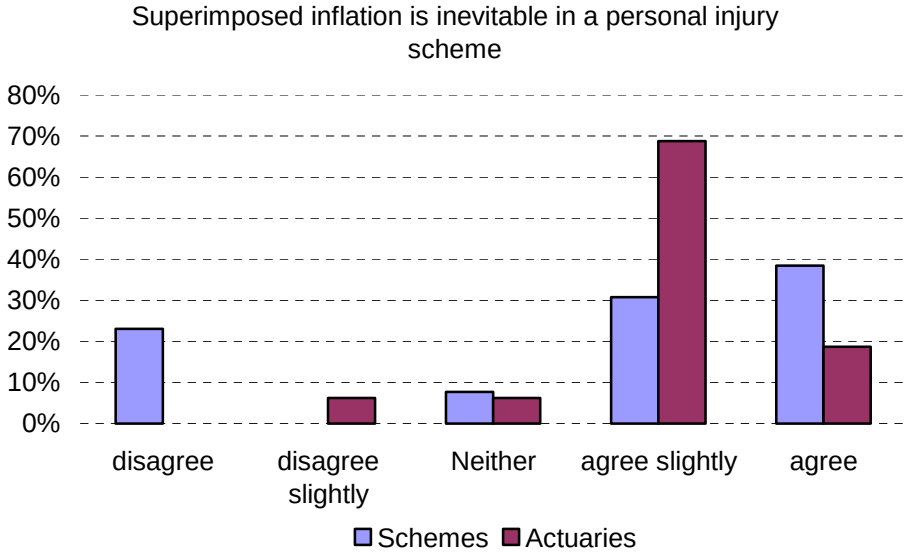


Changes to benefits, (a), was the most popular response across both actuaries and schemes. For the schemes, (d) changes to the management of claims, was the most popular answer although the actuaries did not rate this particularly highly. (b) and (c) exclusion of lawyers and changes to other aspects of the scheme also got a reasonable level of support across respondents.

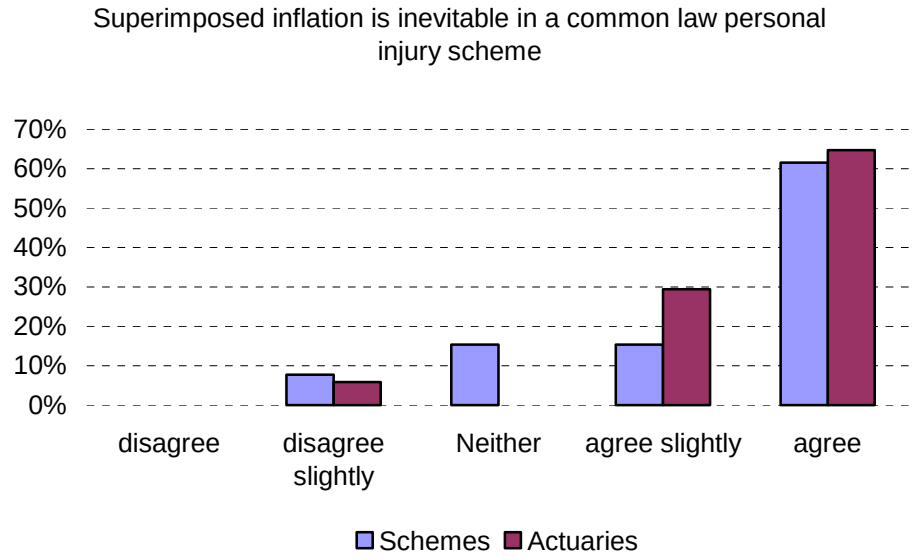
In responding (i) Other to this question, one actuary noted -

"When changes have been made to schemes changes have generally been made across a range of areas. It is often difficult to pin point which change led to the change in superimposed inflation. My impression (it is an impression as I have no hard evidence or data to support the view) is that it is not the changes in themselves that create the change to superimposed inflation it is the effect they have on the scheme culture."

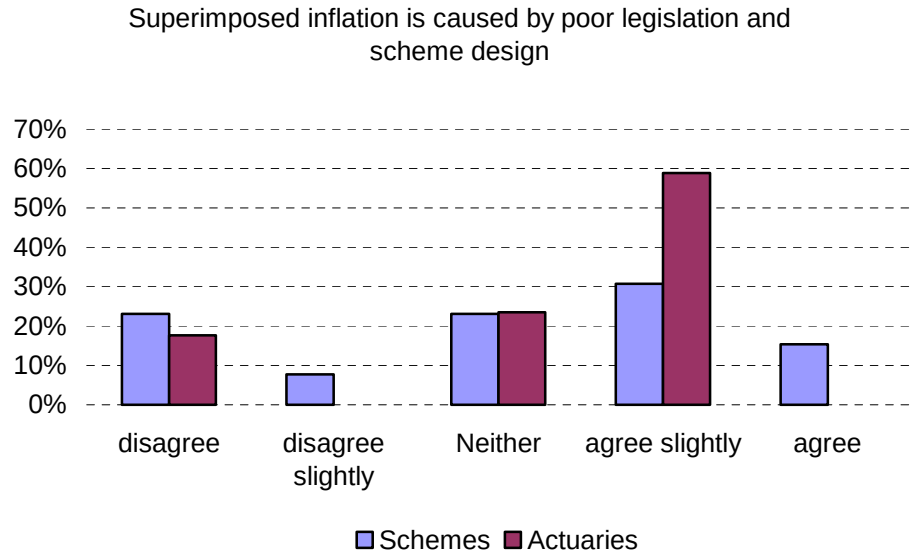
The next question asked respondents to rate certain statements about superimposed inflation on a scale from disagree to agree. The responses from the schemes and the actuaries are compared below.



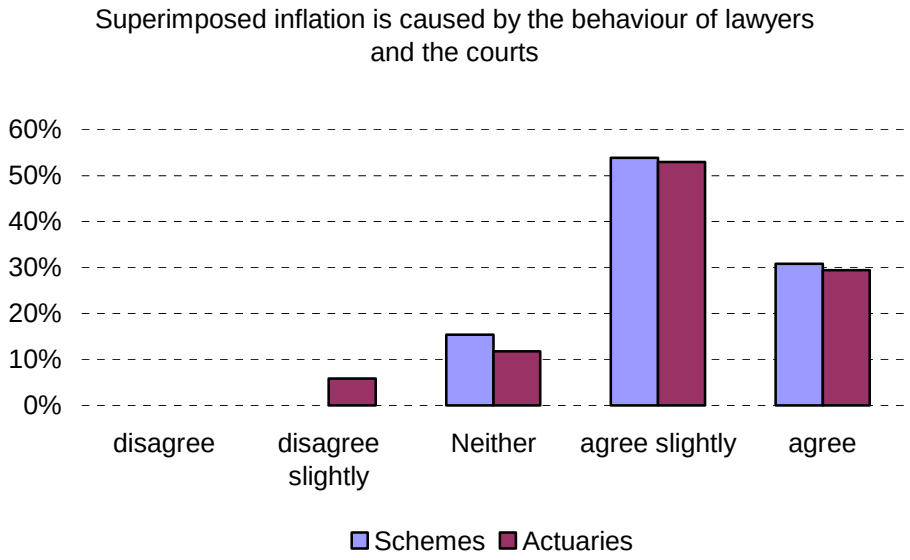
Almost 90% of actuaries agreed or slightly agreed with this statement compared with just under 70% of the schemes. 20% of the schemes disagreed with the statement.



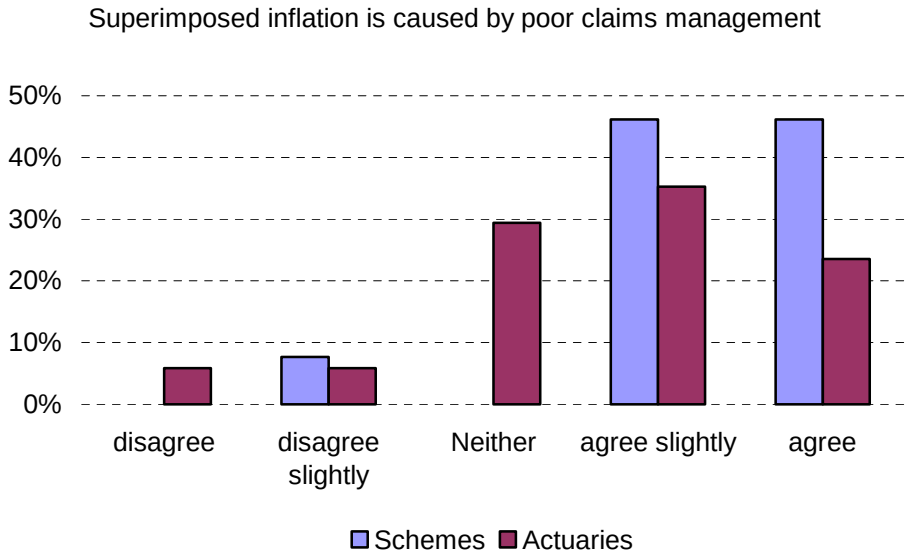
There was more agreement on this question with over 60% of both actuaries and schemes agreeing with this statement with a further 30% (actuaries) and 15% (schemes) agreeing slightly.



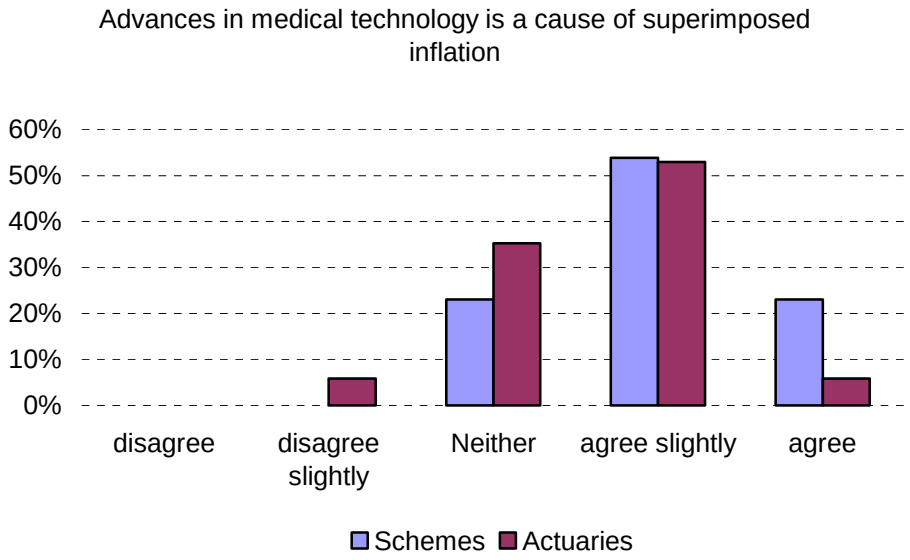
Overall the majority of actuaries (58%) slightly agreed with this statement but the schemes did not agree or disagree.



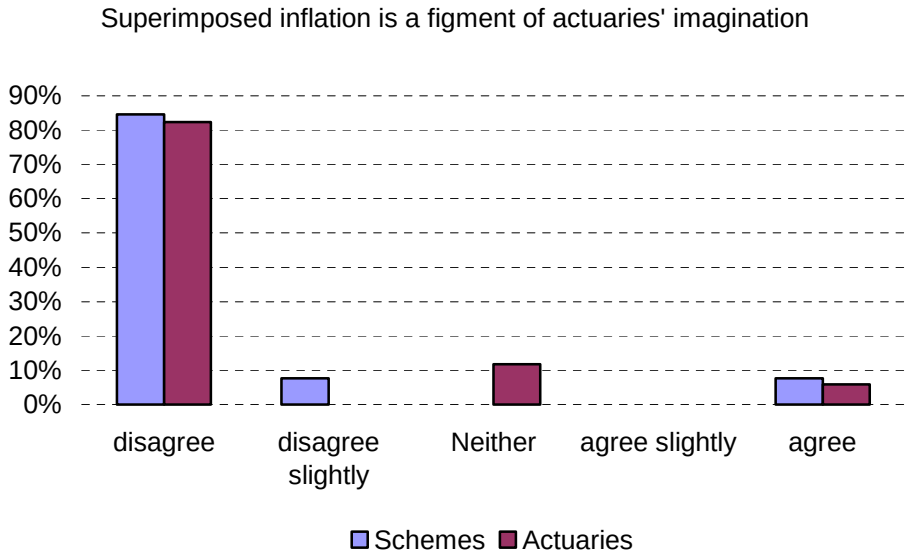
There was strong consensus about the role of lawyers and the courts with 85% of schemes and 80% of actuaries either agreeing or agreeing slightly with this statement. There was almost no disagreement with this statement with only a sole actuary disagreeing slightly.



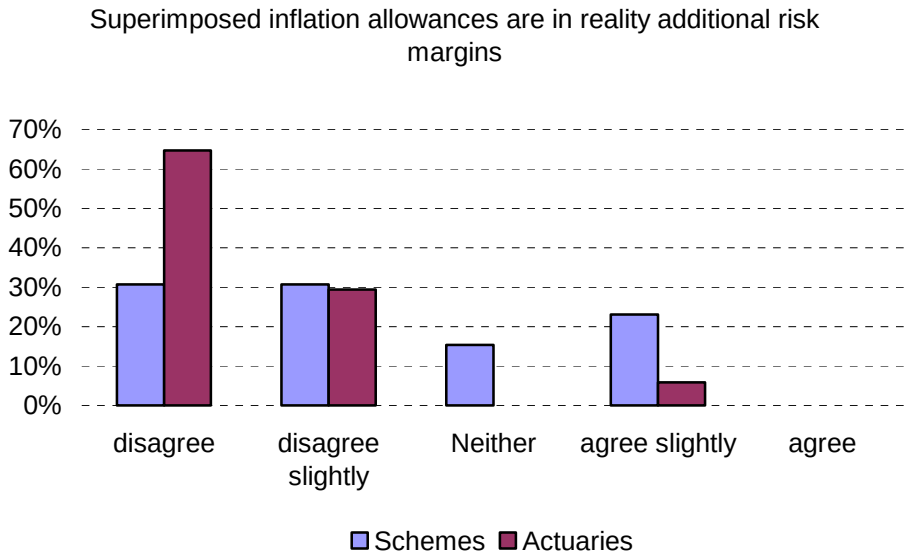
While over 90% of schemes agreed or slightly agreed with this statement only 55% of actuaries did. This probably reflects the different perspectives and roles of scheme managers/regulators and actuaries.



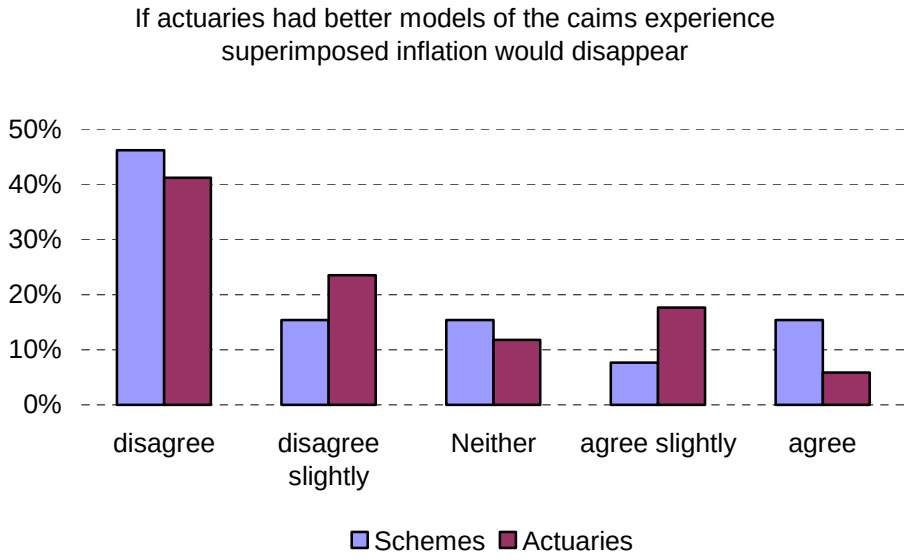
Overall respondents agreed with this statement but not strongly.



Thankfully the majority of respondents (around 80%) disagreed with this statement. However there was a small level of agreement with this proposition from both groups.

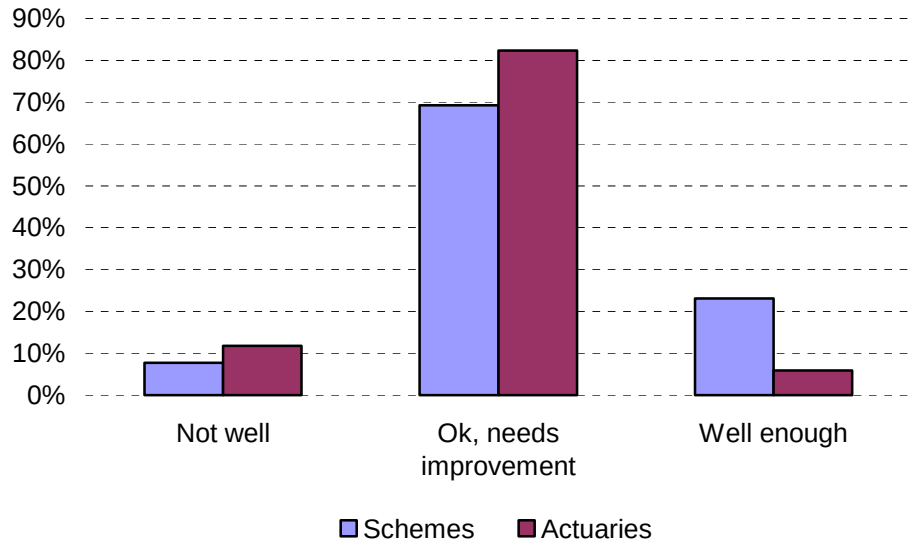


There was more inconsistency in views on this statement between the actuaries and the schemes. 65% of actuaries disagreed with this statement with a further 30% disagreeing slightly. On the other hand, while 60% of the schemes either disagreed or disagreed slightly, 25% agreed slightly.



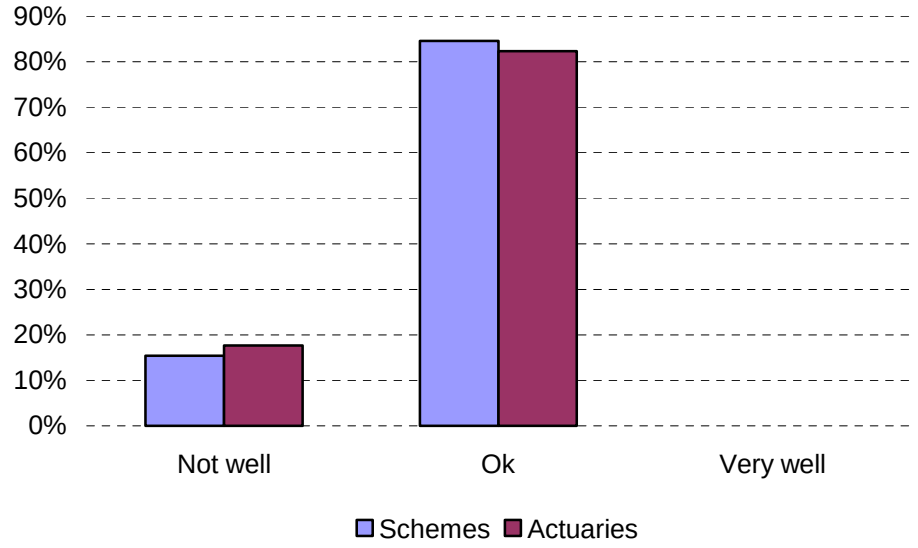
There were mixed views on this but overall disagreement with this statement.

How well do you think that actuaries measure superimposed inflation?



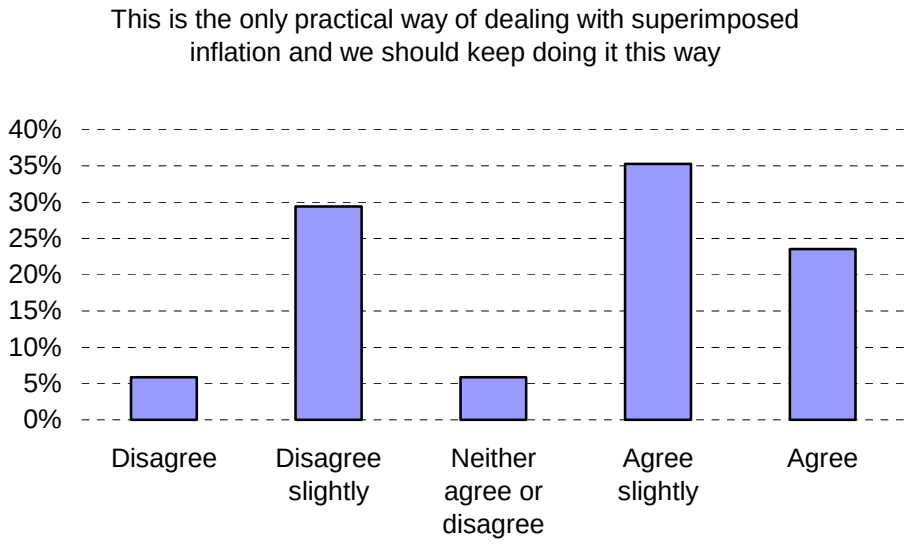
There was agreement between the schemes and actuaries that actuaries measurement of superimposed inflation was adequate but could be improved.

How well do you think that actuaries explain superimposed inflation?

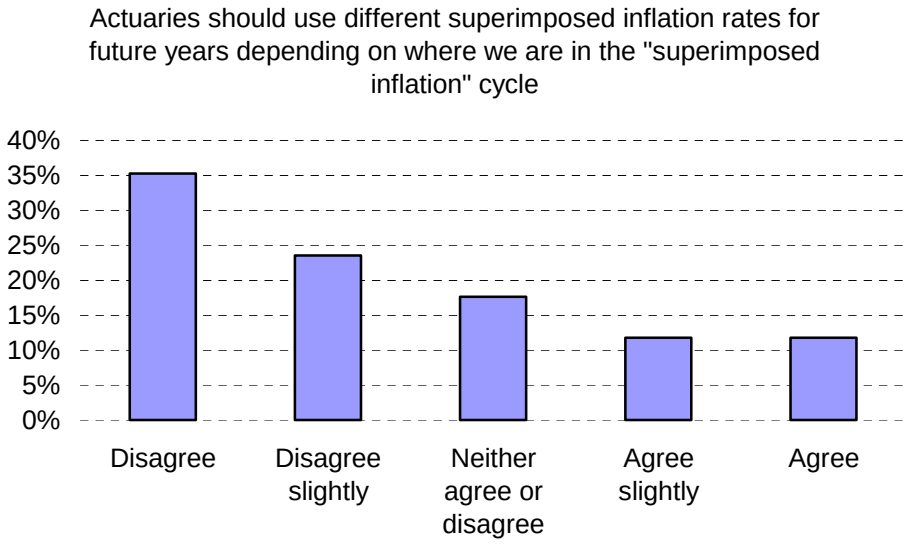


85% of both schemes and actuaries thought that actuaries explained superimposed inflation well enough. No respondents – scheme or actuary – thought actuaries explained superimposed inflation very well.

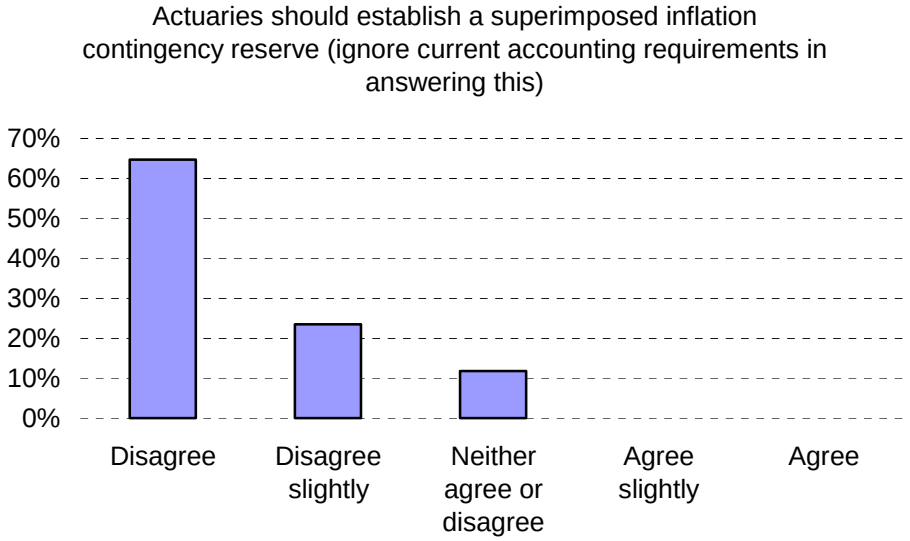
Typically superimposed inflation happens in bouts but actuaries model it as a single average future assumption meaning that over a one year time period the actuary is always likely to be wrong. Rate the following comments about this statement. (Actuaries only)



There was a mixed response to this with 58% agreeing or agreeing slightly and 35% disagreeing or disagreeing slightly. This suggests that there is some discomfort in the profession about the way that superimposed inflation is treated in projections.

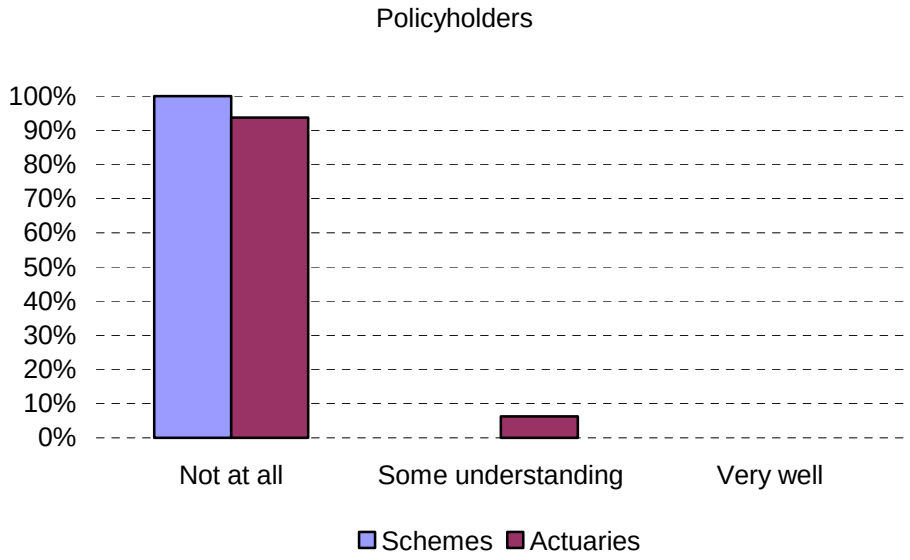


The majority (58%) of actuaries disagreed or disagreed slightly with this proposition, probably because of the difficulty of establishing where we are in the SI cycle and the arbitrary nature of assumptions which vary by year. 25% of actuaries however agreed or agreed slightly with the suggestion while 17 neither agreed nor disagreed.

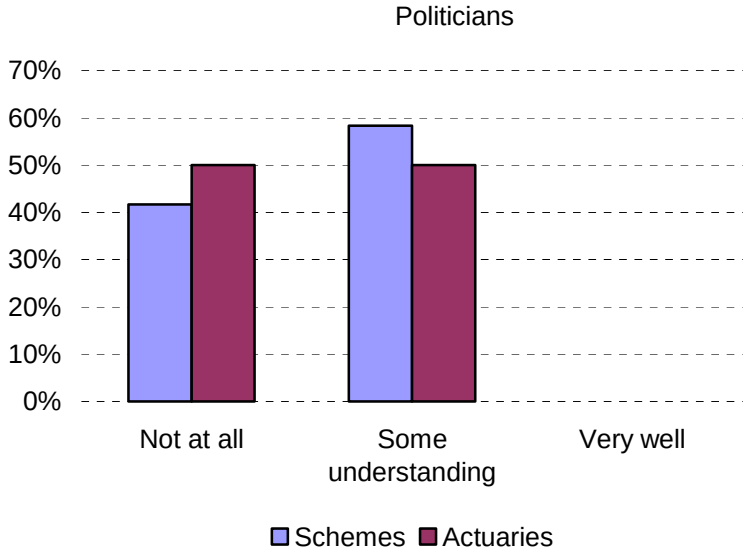


This was not a popular suggestion with over 80% of actuaries disagreeing or disagreeing slightly and no actuaries agreeing (even slightly).

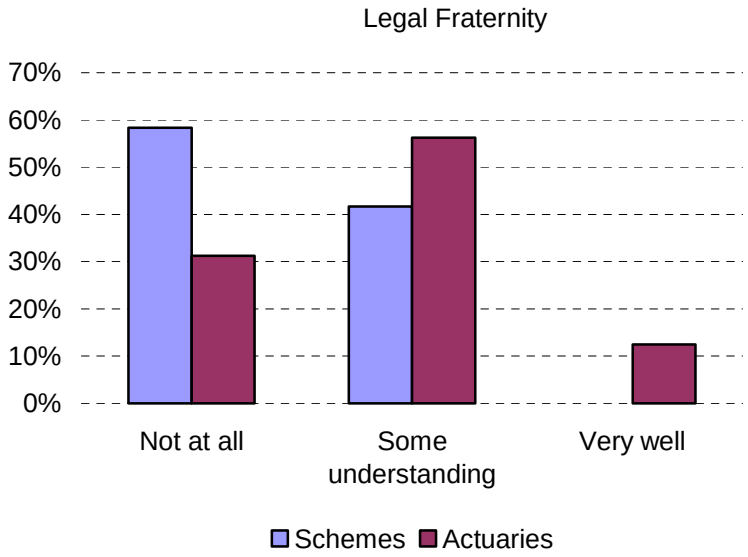
How well do the following stakeholders in accident compensation schemes understand superimposed inflation?



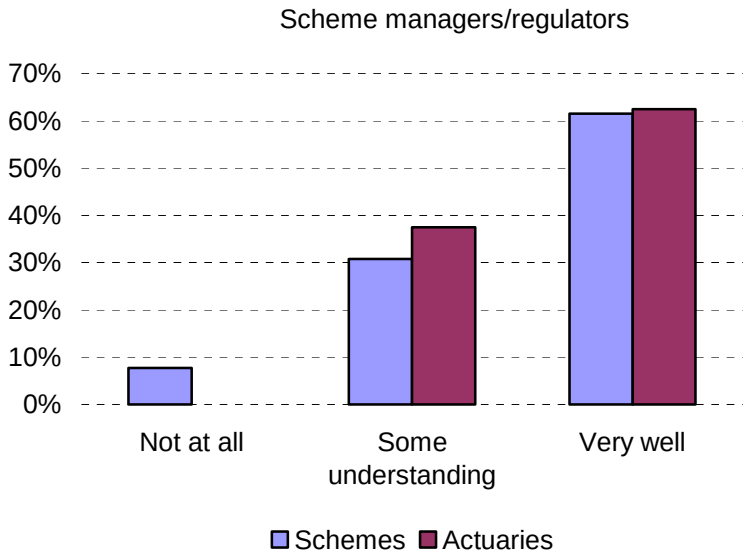
There was almost complete agreement that policyholders do not understand superimposed inflation, which is as would be expected but makes communication about premium rate changes (especially increases) more difficult.



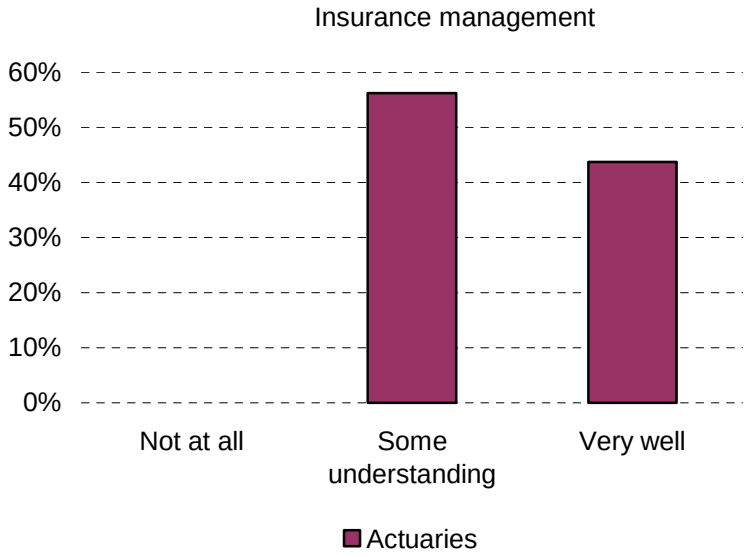
Politicians fare better with 55% of respondents viewing them as having some understanding of superimposed inflation, although around 45% believe that politicians do not understand it at all. Responses from schemes and actuaries were similar.



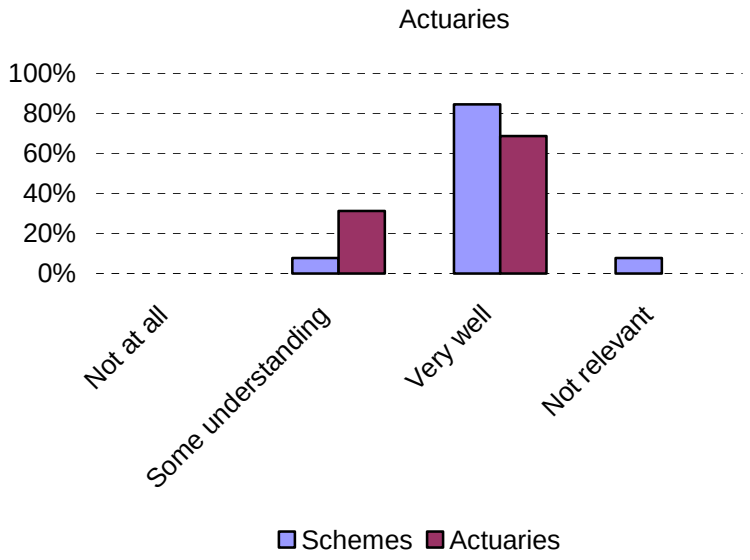
There was some disagreement between actuaries and schemes regarding the legal fraternities' understanding of superimposed inflation, no doubt reflecting different experiences with this group. The majority of actuaries (55%) believe that the legal fraternity has some understanding of superimposed inflation while the majority of schemes (60%) believe that they do not understand it at all.



As might be hoped scheme managers/regulators were viewed by around 60% of all respondents as understanding superimposed inflation very well. The actuaries had slightly more confidence in the understanding of the scheme managers/regulators than the schemes did.



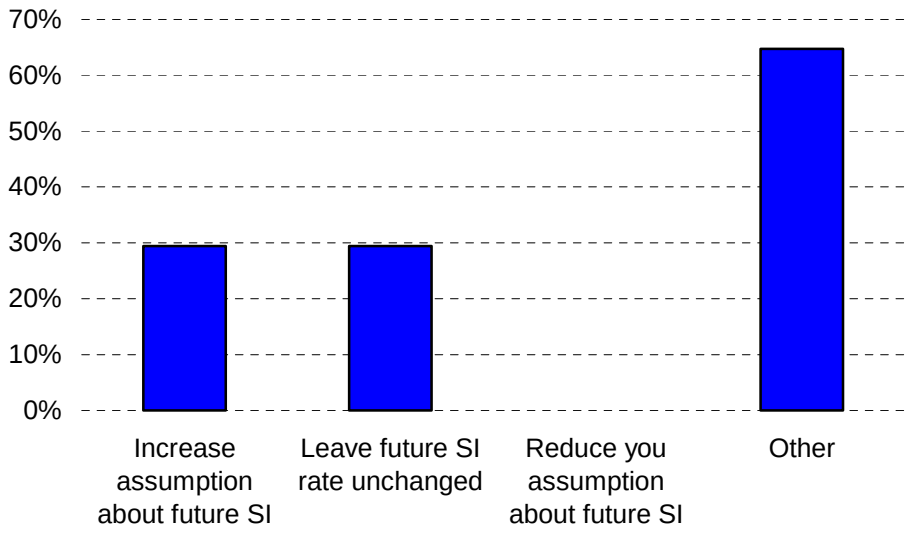
Actuaries rated insurance management with a somewhat worse understanding of superimposed inflation than scheme managers/regulators.



Fortunately both schemes and actuaries rated actuaries has having a very good understanding of superimposed inflation. Some schemes considered this question not relevant as the schemes do not experience superimposed inflation.

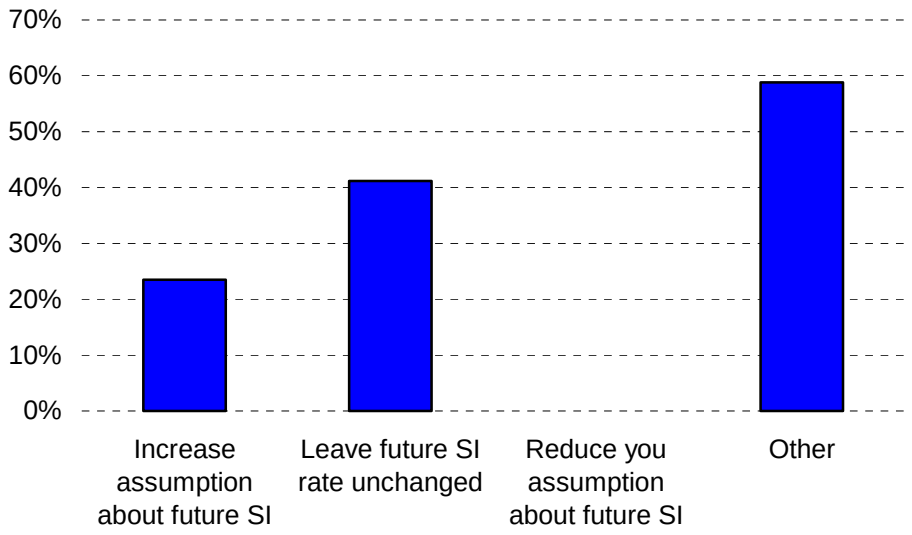
If you observed a very high level of superimposed inflation in the recent past what would you be most likely to do? (Actuaries only)

Note that the total adds to more than 100% as some actuaries ticked two boxes.



For those actuaries responding other most noted that they would need to understand the reasons for the recent high superimposed inflation before working out how to deal with it. As one actuary noted *"The observed rate is one input to the process. Future **sources** of superimposed inflation need to be assessed against observed **sources** and a judgment formed on this basis".*

If you observed no or a negative level of superimposed inflation in the recent past what would you be most likely to do? (Actuaries only)



Unsurprisingly the answer to this question was similar to the preceding one.

We offered a small prize for the best definition of superimposed inflation. The following summarises the entries. We have grouped them into similar themes.

Claim cost escalation above "normal" inflation

"Superimposed inflation is the tendency for benefits for a given injury to increase over time at a rate faster than a suitable standard measure of inflation (typically AWE for compensation schemes)"

"A systemic change in the average claim size after adjustment for wage inflation"

"Superimposed Inflation is the tendency for claims costs to increase at a rate faster than ordinary inflation levels"

"In principle, superimposed inflation is real rate of growth in general insurance claim costs over and above normal inflation (usually measured by wage or price inflation). It can be due to changes in claim numbers/frequency, claim duration, legislation and/or judicial precedents. In practice, the level of superimposed inflation can depend which actuarial projection method is used. For example, if the real claim cost increase is due to longer claim duration, the level of superimposed inflation identified in the PPAC (payment per claim active) method may be very low compared to that identified in the PPCI (payments per claim incurred) method. This is because the PPAC method directly allows for the higher number of active claims and slower claim closure rates whereas the PPCI does not use active claim data at all.

"Define normative predictions of claims experience (payments and/or case estimates) to be those emerging from a model that is stationary in all respects except monetary inflation. Let this latter take some agreed form (e.g. AWE) considered also to be normative. The excess of actual claims experience over predictions with sampling error eliminated; may be designated superimposed inflation.

"Cost increases that claims experience has shown to be in excess of the assumed inflationary rate"

"SI is the increase in claims costs that exceeds inflation, is unrelated to increases in claim frequency and ignore higher claims costs emanating from legislation changes and the like"

"SI is the increase in the average cost of similar claims over and above that which can be explained by measures of inflation such as the CPI and AWE"

"SI is inflation in excess of 'normal' inflation"

"The increase in the average claim size above normal inflation"

"Increases above AWE"

"An increase in the cost of claims not explained by claim frequency or general community inflation"

"It is the escalation in claims costs above the level that would be expected due to normal economic inflationary pressures. The end result is that payments for a similar level of disability and loss increase over time in real values. Both increasing claim costs and increasing claim frequency can be indications that superimposed inflation is present in a scheme since more generous benefit payments provide a greater incentive for an injured person to submit a claim"

"Superimposed inflation is the tendency of claim costs to increase faster than normal inflation. Normal inflation is defined as within the actuarial assumptions and is usually a wage inflation or CPI measure"

Dependency on actuarial models

"Superimposed inflation is generally the additional increase in the total cost of compensation, above a measure of the "ordinary" level of economic inflation, that has not been explicitly provided for by the actuarial model(s) used for claim provisioning. The "ordinary" level is the appropriate normal cost increase for the services/compensation being provided. The superimposed inflation allowance is typically provided for via an increase (or decrease) in the assumed rate of future normal claim inflation.

Use of different actuarial models will generally provide different measures of super imposed inflation. For example an actuarial model may already allow explicitly for increased costs from some sources (change in mix, chance in utilisation) and the superimposed inflation will allow for remaining sources of change. However if the models do not allow for these components the measured superimposed inflation will include them"

"In PWC valuation report it is defined as: "Superimposed refers to trends in the average claim size not due to ordinary wage and cost inflation. As superimposed inflation is a residual effect after other increases have been removed, it is dependent upon the valuation method used and SI may therefore be quite different under different methods of analysis"

"Superimposed inflation is designed to make a general allowance for increased costs that cannot be directly attributed to any specific source under the selected actuarial method"

"Superimposed inflation is any underlying trend in the claim cost experience that is not otherwise explained by an explicit parameter in the model being used for analysis"

"Superimposed inflation is a parameter in a model which allows for future trends in experience. It cannot be considered in isolation from the underlying model"

"SI is the residual growth in claims costs after all other factors in the actuarial model of claims costs have been explained"

"Claim payment escalation over time due to factors that are not otherwise captured by the valuation model"

Other

"The inability of actuaries to adequately analyse or model claims experience or understand the operational and legislative framework"

"Past superimposed inflation is everything not explained by the actuary's data and model. Future superimposed inflation is an assumption"

"A measure of the increase in claim values in excess of the rate of wage inflation. Alternatively, a term dreamt up by actuaries to explain away their miscalculations!"

"An annual level of inflation which actuaries estimate will impact on the cost of claims"

"Inflation that imposes itself on a compensation Scheme after changing in a telephone box, putting a big "S" on its shirt and its underpants on the outside. To fix, hit with Kryptonite"

"Superimposed inflation is a projection of the difference between two things whose past levels are not measurable (ie "actual" inflation and "normal" inflation)"

We finally asked respondents to provide any other comments on the topic of superimposed inflation. The following are the responses.

"Since about 2003 SI has been virtually non-existent which appears a likely result of the introduction of Workflow and Imaging technology which took place in the first half of calendar year 2001. It remains to be seen if this effect will last and consequently a more conservative approach has been taken"

"1. I feel that insurers are inclined to always factor SI into their filings without a rigorous enough analysis of whether it is warranted. SI can occur in irregular bursts so there is not necessarily a justification for applying a similar percentage year in and year out. 2. One of the reasons SI is hard to measure is that it is at least partly due to the net effect of the behaviour of many different but interrelated groups within the personal injury compensation environment:claimant, solicitors, insurers, treatment providers"

"In most actuarial models superimposed inflation is an over arching catch-all for increases in costs from all sources that are not explained by changes in an ordinary measure. For example changes in the mix of business will contribute to superimposed inflation as will changes in benefit utilisation. The measure of super imposed inflation will depend on the actuarial models being used and the appropriate response should depend on the source.

I think there should be more consistency in its measurement, and greater explanation of the sources of super imposed inflation. For example increases in utilisation should be explained as such rather than as a general superimposed inflation.

One issue is the inclusion of a superimposed inflation allowance for expected increases that may not yet have been observed in the experience. For catastrophic clients being paid

attendant care for example there is an expectation that care needs will increase with the duration with injury and as the injured party ages. This may result in additional costs for current claimants but may also result in costs for claimants currently not requiring care. How should these allowances be provisioned ie superimposed inflation allowance or risk margin?"

"SI is a very generic term that can hide the reality as it at times can be used to mask underlying problems. An actuarial report that states "we have observed SI in benefit XX" provides very little to react to. Understanding the drivers is key to allow appropriate management responses whether that is through changed claims management strategies, change process/policies and /or legislative changes"

"SI is a sign of society's increasing generosity (decreasing meanness?) to those who suffer compensable injuries. It can be argued that SI ought to run at about the rate of increases in productivity"

"I tend not to make great variations in the assumption from year to year for SI"

"Most of the work I do is for Self-Insurers where the volume of claims data is inadequate to detect SI. It would be helpful to have some published actuarial information on past SI for each scheme and current expectations for use on these small portfolios"

"Consistent with 11, I believe that different rates of superimposed inflation can be relevant, dependent on the actual model being applied. Despite this, it seems fairly common to see superimposed inflation rates transferred from one model to another. Given the difficulty associated with selecting assumptions, this is not disastrous, but it does not necessarily seem to be well understood.

There are some cases where superimposed inflation is model specific. An understanding of sources of historic superimposed inflation is paramount in making informed decisions about future sources of superimposed inflation. Where explicit benefit changes occur – These changes need to be excluded from analysis of superimposed inflation.

"Actuaries often use their prejudices as a substitute for thorough research"

"Superimposed inflation is often looked at independently of the model adopted (particularly when considering outside information eg scheme report). This is frustrating because it is clearly wrong. As mentioned above if you are using a PPCI method reducing back to work rates (termination rates) results in superimposed inflation for that method. However, a PPAC method or other method that directly deals with termination rates would not need a separate superimposed inflation allowance to deal with this issue.

"a) My views on the conundrum posed by SI, with respect to allowance for it over future years, are set out in my BAJ editorial. b) The definition given in 11 shows SI always to be relative, It is relative to the normative measure of inflation, which is a selection rather than a derivation from data or reasoning.

"Focus on the phenomenon from an actuarial modeling perspective without adequate reference to the "real world" is not helpful"

"There is a large amount of focus on measuring past superimposed inflation and improving models to do this. However, unless this is accompanied by an understanding of the behaviours driving the inflation then the actuary is no better placed in making an assessment of the appropriate allowance for prospective superimposed inflation".