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Continuous Mortality Investigation

Income Protection Committee

WORKING PAPER 60

Sickness Experience for Individual Income Protection Policies:

Experience for 2003-2006 compared with 1991-2002;

Results for 1991-2006 re-stated using IPM 1991-98 as the comparison basis

February 2012

EXECUTIVE SUMMARY

This Paper presents the results of an analysis of the Claims experience for Individual Income Protection (IP) policies for the quadrennium 2003-2006 and includes a comparison with the experience of the three quadrennia covering the period from 1991 to 2002.

The investigation is based on the mathematical model described in CMIR 12 for the analysis of IP experience. The methodology is set out in CMI Working Paper 59. The basic approach is to compare actual Claim Inceptions and Terminations with those expected using the Sickness graduations IPM 1991-98 which reflect the experience of Individual Income Protection *Standard** business for males in CMI Occupation Class 1 over the period 1991-98.

This is the first time the IPM 1991-98 graduations have been used as the comparison basis (replacing SM1975-78). The full sets of quadrennium results tables covering 1991 to 2006 have been re-stated using this new basis and issued alongside this Paper in spreadsheet form.

The key points arising from the analysis are described below:

- The volumes of data submitted to the Investigation decreased substantially from the levels of the previous quadrennium, due to the withdrawal of some companies from the Investigation, but remain above the volumes of data collected for 1991-98.
- The CMI has been collecting IP data classified by Occupation Class since 1991. However, some contributors remain unable to supply data in this form so that almost 30% of the In force data and 20% of the Claims data are still analysed as "Class Unknown".
- Across all Deferred Periods, the Claim Inceptions experience for males and females is considerably lighter than the previous quadrennium. This represents a continuation of the trend observed between 1991-94 and 1999-2002 of generally improving Inception rates.
- The Claim Inceptions experience for females remains significantly heavier than that for males for the longer Deferred Periods (DP13, DP26 and DP52). The differences are less pronounced for the shorter Deferred Periods and, for the first time since this Investigation started, the Inceptions experience for DP1 is lighter for females than for males.
- Claim Inceptions experience becomes heavier from Occupation Class 1 to Class 4. This feature has been present in the experience of the 4 quadrennia, but the gradient in Inception rates by Occupation Class has become significantly shallower over time.
- Claimant Recovery rates for almost all Deferred Periods have increased since the last quadrennium. Further, where there is an increase in Recovery rates, that increase becomes larger the longer the Deferred Period. This also represents an improvement in Claims experience as higher Recovery rates mean shorter Claims.
- Trends observed over time from the All Office data may potentially be distorted by changes in the mix of offices contributing (as significant variations in experience by office have previously been observed) or by changes to underwriting practices and claims management procedures.

Having now completed the reporting of the IP experience for 1991-2006 using the new IPM 1991-98 graduations as the basis of comparison, the Committee intends to propose adoption of the IPM 1991-98 graduations by the Actuarial Profession in Spring 2012. Prior to this, further feedback is invited by 30th March 2012.

Sickness Experience for Individual Income Protection Policies: Experience for 2003-2006 compared with 1991-2002; Results for 1991-2006 re-stated using IPM 1991-98 as the comparison basis

CONTENTS

1. INTRODUCTION

The CMI Income Protection (IP) Committee's main focus over recent years has been on producing a new set of Sickness graduations, referred to as IPM 1991-98. Now, for the first time, this Paper presents Individual IP business experience, over 1991-2006, using the new graduations as the basis of comparison.

The CMI Report on Sickness Experience for Individual IP policies for the quadrennium 1999-2002 was published in CMIR 22. The observed Claim Inceptions and Terminations were compared with those expected using the Sickness graduations SM1975-78, that is graduations derived from the CMIR 12 multiple-state model for IP business parameterised using the Individual IP business *Standard* experience for males over the period 1975-78. The same reporting basis was adopted for the two previous quadrennia, 1991-94 reported in CMIR 18 and 1995-98 reported in CMIR 20.

The new set of Sickness graduations, IPM 1991-98, also uses the CMIR 12 model but reflects the experience of Individual IP business for males in CMI Occupation Class 1 over the period 1991-98. The development work took very much longer than we would have liked, due in large part to the complexity of IP risks and the limitations of the available data, but was completed in 2010. CMI Working Paper 48 provides an overview of this graduations work.

An analysis of experience for 2003-06 was issued to CMI member offices in April 2010 using SM1975-78 as the basis of comparison. This Paper therefore completes the publication of experience for 2003-06, and enables practitioners to study the CMI Individual IP experience of the four most recent available quadrennia against the IPM 1991-98 graduations.

This Paper marks an important step for the CMI IP Investigation. It brings the new graduations fully into use, incorporates a number of methodology refinements into the Investigation and introduces a new reporting format for the results.

The updated methodology for analysing the experience of IP business is set out in CMI Working Paper 59. The basic approach is to compare actual Claim Inceptions and Terminations with those expected using the Sickness graduations IPM 1991-98. However, as well as introducing the new graduations, a number of refinements have been made to the counting of Claim events and to the calculation of exposed-to-risk and expected Claims. CMI Working Paper 59 also includes a summary of these changes together with a high-level quantification of the effect of the changes, to both methodology and basis, on the results.

In the past, results have been presented through a large number of tables provided as appendices to each report. Now, to make them more easily accessible, the results of the analysis of the experience for 2003-06 are presented as a series of tables in a spreadsheet (MS Office Excel workbook) format issued alongside this Working Paper. A full description of the content and format of the results tables is provided in CMI Working Paper 59 along with an overview of the statistical tests incorporated into the analysis and results tables.

This focus of this Paper is the experience of the quadrennium 2003-06. However, it is helpful to compare this experience with that of previous quadrennia. As this is the first Paper to present results using IPM 1991-98 as the basis for expected Claim Inceptions and Terminations, the experiences for 1991-94, 1995-98 and 1999-2002 have been re-stated on this basis and the results issued, also in spreadsheet format, alongside this Working Paper.

The structure of the Paper is as follows:

- Section 2 provides an overview of the CMI Individual IP All Office dataset for 2003-06
- The features of the Claim Inceptions experience are summarised in Section 3
- The features of the Claim Terminations experience are summarised in Section 4
- Section 5 lists the life offices which contributed data for the 2003-06 quadrennium
- A summary of CMI Reports and Working Papers charting the development of the IP Investigation and experience is provided in the Appendix as a source of reference.

To facilitate comparisons over time, and the observation of possible trends, most of the Tables and Figures in this Paper present results for each of the four quadrennia. The associated workbooks provide further detail on the results separately for each quadrennium.

Some previous CMI IP experience Reports, for example CMIR 22, included information on the variation in experience by office and investigation of the experience of the 'loyal' offices subset – that is, those offices present throughout the investigation period. Such investigations have not been attempted for this Paper, but the IP Committee does expect to return to similar issues in future investigations.

It is disappointing to note that the volume of data collected for the Investigation has fallen back from the level of the 1999-2002 quadrennium, although the In force data volumes do remain above those collected over the period 1991-98. This fall is attributable to a net reduction in the number of offices contributing data and to the natural running down of some closed books of IP business within the dataset.

Given the many changes and challenges facing the industry in recent years, it is understandable that data provision has not always been near the top of the agenda. This adversely affects both the willingness of offices to submit data and the timescales for production of each year's All Office results. The IP Committee is actively engaged with both current and potential data contributors and is optimistic that data volumes may rise again for the 2007-10 quadrenniun. Although a revised IP Coding Guide (v3.0) was issued in 2009, the Committee continues to operate a pragmatic approach to data submission, working flexibly with offices to make data submission easier.

We thank all the contributing offices for their continuing efforts and support.

This Paper complies with the material requirements of the principles in the Board for Actuarial Standard's generic TASs. In particular, TAS D and TAS M have been met insofar as their principles are applicable.

In CMI Working Paper 48, the Committee signalled its intention to propose adoption of the IPM 1991-98 graduations by the UK Actuarial Profession. Reporting the IP experience for 1991-2006 using the new graduations as the basis of comparison is an important part of the process and, having completed that step with this Paper, the Committee now intends to propose adoption of the graduations by the Profession in Spring 2012. Prior to this, members of the Profession are invited to provide any further feedback they feel may be helpful. In particular we would welcome, by 30th March, any comments which members believe should be considered before or during the process of seeking adoption by the Profession.

Please send any comments on this Paper or the IP Investigation via e-mail to ip@cmib.org.uk or in writing to: CMI, Cheapside House, 138 Cheapside, London, EC2V 6BW.

2. THE DATA

2.1. Description of the data

The data received by the CMI for Individual Income Protection business consists of a record for each In force policy, in respect of each calendar year end, and a record for each Sickness Claim (at policy level) which is in force during an Investigation Year – thus, one Claim which spans several years generates at least one separate record for each applicable policy in each Investigation Year.

All records contain fields describing the attributes of each policy, and Claims records contain additional fields relating to the duration and other features of the Claim. See Section 2.1 of CMI Working Paper 59 for further details.

2.2. The Aggregate data and the Standard subset*

The total data is referred to as the ***Aggregate*** data. However, for the main analysis, non-UK policies, policies with special benefit types (such as lump sums or waiver), and policies with identifiable underwriting exclusions are all excluded to restrict the analysis to a subset of the Aggregate data referred to as the ***Standard**** data.

2.3. Subdivision of the data

For Investigation years 1991 onwards, the Claim Inceptions and Terminations experience is analysed for the *Standard** data subset by:

- Year (or quadrennium: 1991-94, 1995-98, 1999-2002 and 2003-06)
- Sex: male and female
- Deferred Period (DP): 1, 4, 13, 26 and 52 weeks
- CMI Occupation Class (OC): Classes 1, 2, 3, 4 and Unknown (see Section 2.4)
- Age (at commencement of Sickness)
- Duration Sick.

2.4. CMI Occupation Class

The CMI's approach to occupational classification of the data is described in Section 2.4 of CMI Working Paper 59. In essence, this involves converting each office's own internal occupation class code to one of the four standard classes used by the CMI. The CMI Occupation Classes can broadly be described as follows:

Class 1	Professional, managerial, executive, administrative and clerical classes not engaged in manual labour.
Class 2	Master craftsmen and tradesmen engaged in management and supervision; skilled operatives engaged in light manual work in non-hazardous occupations.
Class 3	Skilled operatives engaged in manual work in non-hazardous occupations.
Class 4	Skilled and semi-skilled operatives engaged in heavy manual work or subject to special hazard.

Not all offices, however, can provide a complete breakdown of all their data by Occupation Class. This requires a fifth subset of the *Standard** data, "Class Unknown", to be analysed. This presents no special problems with the analysis of Claim Terminations, but the analysis of Claim Inceptions requires consistent coding by Occupation Class for three sets of data – In force at both the beginning and end of a year and Claims during the year – and where inconsistencies are present the Claim Inceptions experience is analysed under "Class Unknown". As some offices can code only Claims data by Occupation Class but not In force data, the proportion of "Class Unknown" business is significantly lower for the Claim Terminations analysis than for the Claim Inceptions analysis.

2.5. Duplicate Records

Duplicate records typically occur when a policyholder buys additional cover of the same 'type', so that the dataset contains a number of separate records with sufficiently similar conditions for it to be better to treat them as one policy / Claim rather than as several.

The submitted data contains Duplicate records arising from both multiple policies and multiple records for the same policy. It is important to identify Duplicate records within the data, where possible, and to remove them, or make other suitable allowances, as their inclusion would otherwise undermine the statistical model and analysis.

We can identify Duplicates within the Claims records with reasonable confidence and this is sufficient to enable to Claim Terminations Analysis to proceed on an ex Duplicates basis – that is: with Duplicates removed from both the Claim events and the exposed–to-risk.

However, it is not possible to identify Duplicates in the In force data as there are insufficient fields capable of differentiating between similar and Duplicate policies. Therefore, although the Claim Inceptions may be counted both including and excluding Duplicates, the ex Duplicates exposed-to-risk can only be estimated by scaling down the cum Duplicates values – that is: exposures are calculated using the files including Duplicates. See Sections 2.5 and 3.4 of CMI Working Paper 59 for further details.

2.6. Features of the data for 2003-06

A detailed breakdown of the data for the quadrennium 2003-06, analysed by attribute, is given in Table 2.1. It shows for the *Aggregate* data, together with the *Standard** subset, the number of policies In force at the beginning and end of each Investigation Year, summed across all four years in the period. It also shows separately the number of Claim records similarly summed across the four-year period. A number of features emerge from an examination of this Table and similar tables in respect of earlier quadrennia.

For the 2003-06 quadrennium, the *Standard** data represents about 98% of the *Aggregate* In force data and about 95% of the *Aggregate* Claims data. The policy attributes which lead to exclusion of those records from the *Standard** data are marked with a †. These are:

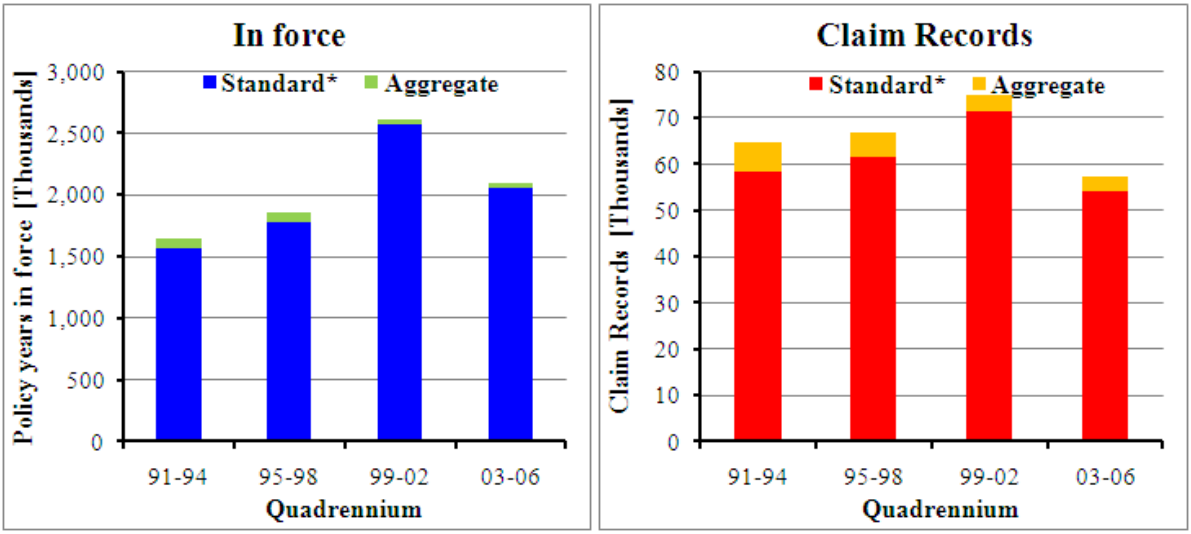
- Identifiable underwriting exclusions – accounting for around 2% of the *Aggregate* data by In force and around 5% by Claim records.
- Non-UK business – There are a small number of Channel Island and Isle of Man policies to exclude but these account for less than 0.1% of the *Aggregate* data; and
- Special benefit types (such as lump sums or waiver) – although there are no such covers in the 2003-06 *Aggregate* data.

Table 2.1: Individual IP policies, 2003-2006, *Aggregate* and *Standard** data. Number of policies In force at the beginning and end of each Investigation Year and number of Claims records summed across the four-year period.

Attribute	*Aggregate* Data			*Standard** Data		
	In force at start of year	In force at end of year	Claim records	In force at start of year	In force at end of year	Claim records
Total Records	2,111,436	2,074,690	57,221	2,069,820	2,034,132	54,266
Investigation Year						
2003	574,994	568,498	15,269	564,536	558,308	14,434
2004	512,122	514,525	14,559	501,932	504,421	13,799
2005	505,893	495,722	13,547	495,789	485,920	12,833
2006	518,427	495,945	13,846	507,563	485,483	13,200
Sex						
Male	1,566,689	1,520,950	46,448	1,535,492	1,491,074	43,973
Female	544,747	553,740	10,773	534,328	543,058	10,293
Country						
UK	2,110,374	2,073,642	57,221	2,069,820	2,034,132	54,266
Republic of Ireland†	0	0	0	0	0	0
Isle of Man†	372	374	0	0	0	0
Channel Islands†	690	674	0	0	0	0
Occupational Rating						
Not rated	1,490,610	1,448,901	42,794	1,454,542	1,413,552	40,113
Rated	585,840	557,430	12,742	580,292	552,221	12,468
Unknown	34,986	68,359	1,685	31,986	68,359	1,685
Benefit Type						
Level	750,577	762,319	23,301	733,696	746,305	21,941
Increasing	1,358,609	1,310,562	33,506	133,998	1,286,121	31,939
Decreasing	2,250	1,809	414	2,126	1,706	386
Waiver†	0	0	0	0	0	0
Lump Sum†	0	0	0	0	0	0
Other†	0	0	0	0	0	0
Medical Evidence						
Medical	158,532	145,575	6,735	152,835	140,421	5,919
Non-medical	535,046	502,710	23,115	500,505	468,591	21,034
Non-selection	155	135	9	151	131	9
Unknown	1,417,703	1,426,270	27,362	1,416,329	1,424,898	27,304
Premium Type						
Level annual	949,923	939,795	31,084	929,433	920,509	29,350
Recurrent single	0	0	3	0	0	3
Increasing annual	1,086,884	1,060,357	25,737	1,065,758	1,039,085	24,516
Other	74,629	74,538	397	74,629	74,538	397
Underwriting Impairment						
No extra risk	940,799	886,220	38,796	940,799	886,220	38,796
Hypertension†	342	312	39	0	0	0
Neurosis†	9,922	10,065	605	0	0	0
Exclusion possible	1,130,083	1,148,960	15,470	1,129,021	1,147,912	15470
Other†	30,290	29,133	2,311	0	0	0
CMI Occupation Class						
Class 1	1,076,041	1,068,687	37,600	1,039,357	1,032,729	34,912
Class 2	203,533	205,045	4,465	200,811	202,480	4,350
Class 3	124,775	129,023	3,103	123,598	127,939	3,017
Class 4	83,287	85,254	2,336	82,259	84,307	2,271
Class unknown	623,800	586,681	9,717	623,795	586,677	9,716

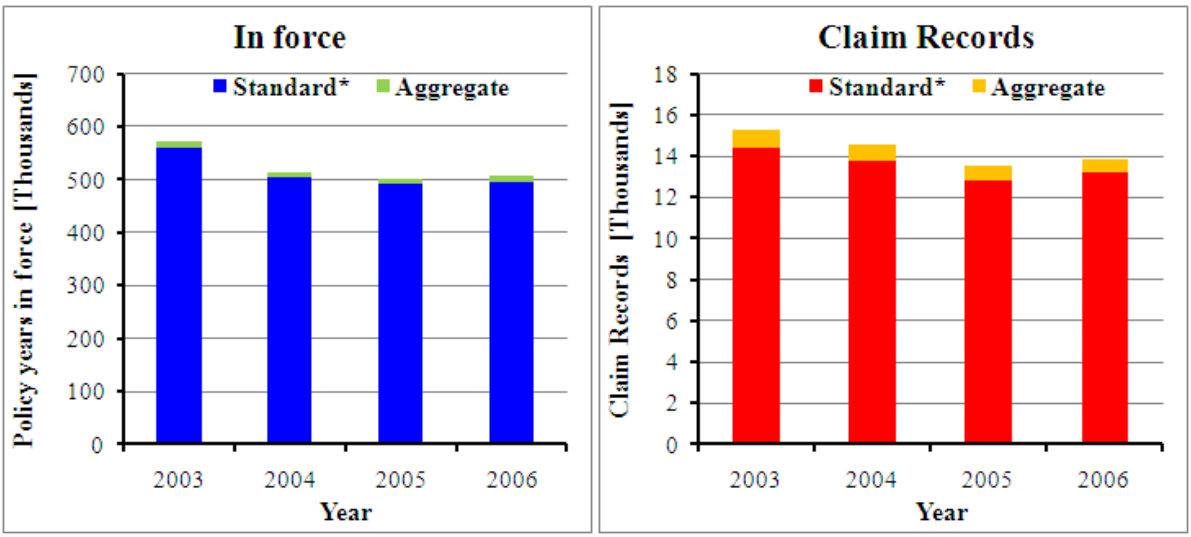
Figure 2.1 shows the comparison of the volume of *Standard** and *Aggregate* (total column height) In force and Claims records submitted for Individual IP business for 2003-06 with the data volumes for the previous three quadrennia. The In force volumes are calculated as the average of the In force number of policies at the beginning and end of each year and therefore represent a broad measure of exposure by "policy years In force". The Claims volumes are measured by the total number of Claims records received.

Figure 2.1:
Comparison of volumes of *Aggregate* and *Standard** data for individual IP business, 1991-2006 by quadrennium



The volume of data for 2003-06 has decreased from the amount collected in the previous quadrennium, although the In force data volumes do remain above those collected over the period 1991-98. The reduction for 2003-06 is due to a withdrawal of some companies from the Investigation towards the start of the quadrennium, as illustrated in Figure 2.2.

Figure 2.2:
Comparison of volumes of *Aggregate* and *Standard** data for individual IP business, in 2003, 2004, 2005 and 2006.



The breakdown by Deferred Period of the In force and Claims records of the *Standard** data subset is shown in Table 2.2 for the four most recent quadrennia.

Table 2.2:
Distribution of In force and Claims records by Deferred Period
Individual Income Protection *Standard** data, 1991-2006 by quadrennium

Deferred Period	In force records (%) (*Standard**)				Claims records (%) (*Standard**)			
	91-94	95-98	99-02	03-06	91-94	95-98	99-02	03-06
1 week	7	5	3	3	37	31	21	21
4 weeks	20	15	12	10	24	20	18	16
13 weeks	30	30	33	33	18	21	25	24
26 weeks	30	31	31	33	15	19	24	25
52 weeks	14	19	21	21	6	9	12	14
All	100	100	100	100	100	100	100	100

Table 2.2 shows a shift in mix of business by Deferred Period, for both In force and Claims records, so that the proportion of the business at the three longer Deferred Periods has increased over the period from 1991-94 to 2003-06, and the proportion for the two shorter Deferred Periods has reduced. However, the change from 1999-2002 to 2003-06 is small compared with the changes over the previous quadrennia.

The overall distribution of records by Deferred Period differs markedly between In force and Claims records. The Claims records are more heavily weighted to the shorter Deferred Periods reflecting the naturally higher Claims frequency. In addition, the increase in the proportion of records contributed by the longer Deferred Periods (particularly DP 13 and 26) is more marked for Claims than for In force.

The breakdown of the In force and Claims records by Sex is shown is Table 2.3.

Table 2.3:
Distribution of In force and Claims records by Sex
Individual Income Protection data, 1991-2006 by quadrennium

Sex	In force records (%) (*Standard**)				Claims records (%) (*Standard**)			
	91-94	95-98	99-02	03-06	91-94	95-98	99-02	03-06
Males	86	81	77	74	88	86	81	81
Females	14	19	23	26	12	14	19	19
All	100	100	100	100	100	100	100	100

The main feature shown by Table 2.3 is the shift in mix of business by Sex, for both In force and Claims records, so that the proportion of records relating to females has increased markedly over the four quadrennia. In fact, this proportion has been continuously increasing throughout the history of the Investigation – at the beginning of 1975 the proportion was only some 4% – although the most recent quadrennium perhaps shows a levelling off.

Table 2.4 shows the breakdown of *Standard** data by CMI Occupation Class. A striking feature is that a large proportion of business is still coded as "Class Unknown". Although that proportion fell from 1991-94 to 1999-2002, it has increased again – markedly so for In force records – for the 2003-06 quadrennium. Some contributors are able to provide data on Occupation Class for Claims records but not for In force records, so that the proportion of data recorded as Class Unknown is higher for the In force than for Claims, and the movement of such offices, in and out of the Investigation, is a major component of the change in the latest quadrennium.

Making suitable adjustment for the change in the proportion of business recorded as Class Unknown, the latest quadrenniun also shows a modest shift in mix by (known) Occupation Class with an increase for Class 1 In force and Claims business relative to the other Occupation Classes. This further strengthens the domination of Class 1 business in the CMI Individual IP dataset.

Table 2.4:
Distribution of In force and Claims records by CMI Occupation Class
Individual Income Protection *Standard** data, 1991-2006 by quadrennium

CMI Occupation Class	In force records (%) (*Standard**)				Claims records (%) (*Standard**)			
	91-94	95-98	99-02	03-06	91-94	95-98	99-02	03-06
Class 1	46	57	56	50	62	66	60	64
Class 2	5	10	13	10	4	7	10	8
Class 3	3	7	8	6	3	7	8	6
Class 4	2	4	5	4	3	5	5	4
Class Unknown	44	22	18	29	28	16	17	18
All	100	100	100	100	100	100	100	100

A second, perhaps more informative, way of looking at volumes of data is by the number of significant 'events' – Claim Inceptions and Claim Terminations by Recovery and Death. A breakdown of the *Standard** experience by the numbers of analysed events, by CMI Occupation Class within Deferred Period, for 1991-2006 by quadrennium, is presented in Tables 2.5 and 2.6. For convenience the same underlying information is represented in Tables 2.7 and 2.8 to illustrate the distribution of analysed events by CMI Occupation Class within each Deferred Period and quadrennium.

The key features of these Tables (with an emphasis on the latest quadrennium) are:

- The actual number of Claim Inceptions is shown in Table 2.5. The numbers are presented both including Duplicates (cum Duplicates) and excluding Duplicates (ex Duplicates). It can be seen that Duplicates are far more prevalent in the 1 week Deferred Period business than for the other Deferred Periods. The statistical analysis of experience uses the ex Duplicate counts of Claim events. However, the ratio (smoothed by Age) of ex Duplicate to cum Duplicate Claim Inceptions is used as the best available approximation in the calculation of (ex Duplicate) exposure for the Claim Inceptions experience analysis.

- As noted above, some offices could not submit In force data coded by Occupation Class even though they could provide Claims data so coded. This results in a far higher proportion of business being classified as Class Unknown for the In force than for Claims records and so also to a higher proportion of Claim Inceptions being classified as Class Unknown than Claim Terminations, as can be seen by comparing Tables 2.7 and 2.8.

- In aggregate and across all Deferred Periods, the number of Claim Inceptions has fallen significantly between 1999-2002 and 2003-06. This is due to a combination of a fall of In force business volumes and a reduction in the Claim Inceptions rate experienced over this period. The scale of the fall is fairly consistent across all Deferred Periods, but larger for Occupation Classes 2, 3 and 4 than Occupation Class 1 and the Class Unknown category.

- The overall number of Claimant Recoveries has also fallen quite significantly between 1999-2002 and 2003-06. This reflects the fall in the volume of Claims records in the most recent quadrennium, but with the impact partially counteracted by an increase in Recovery rates experienced over the same period.

- Looking at the data by Deferred Period, the percentage reduction in the number of Recoveries is larger for DP1 and DP4 than for the other Deferred Periods and this can be explained by the increase in Recovery rates being greater for the longer Deferred Periods. For DP52, the percentage reduction in the number of Claims records was not as large as for the other Deferred Periods and, combining this with a large increase in the Recovery rates experienced over the period, the number of Claimant Recoveries at DP52 has increased from 1999-2002 to 2003-06.

- In general, the percentage reduction in the number of Claim events for Occupation Classes 2, 3 and 4 is larger than that for Occupation Class 1 and Class Unknown.

Table 2.5:
Volumes of data by number of analysed events: **Claim Inceptions**
Individual Income Protection Standard* data
1991-2006 by quadrennium, by CMI Occupation Class within Deferred Period

Category (DP / Occ Class)	Number of Claim Inceptions cum Duplicates				Number of Claim Inceptions ex Duplicates			
	91-94	95-98	99-02	03-06	91-94	95-98	99-02	03-06
DP1								
Class 1	14,602	11,836	8,534	5,652	6,243	5,049	3,505	2,380
Class 2	1	8	8	0	1	8	8	0
Class 3	0	2	1	0	0	2	1	0
Class 4	1	0	0	0	1	0	0	0
Unknown	76	0	0	0	74	0	0	0
All DP1	14,680	11,846	8,543	5,652	6,319	5,059	3,514	2,380
DP4								
Class 1	2,162	2,060	1,641	1,109	1,599	1,474	1,180	783
Class 2	365	363	404	167	322	335	347	143
Class 3	463	505	535	203	437	474	507	184
Class 4	442	388	260	139	405	353	244	116
Unknown	2,916	962	901	550	2,775	904	844	530
All DP4	6,348	4,278	3,741	2,168	5,538	3,540	3,122	1,756
DP13								
Class 1	844	1,122	1,420	842	611	865	1,184	710
Class 2	161	317	540	246	145	282	506	232
Class 3	104	261	344	145	97	245	331	140
Class 4	106	193	316	148	101	188	298	146
Unknown	1,682	824	938	744	1,601	777	896	720
All DP13	2,897	2,717	3,558	2,125	2,555	2,357	3,215	1,948
DP26								
Class 1	786	1,221	1,466	941	554	919	1,213	763
Class 2	73	192	296	135	69	182	274	125
Class 3	48	141	167	84	46	125	130	75
Class 4	39	75	92	60	37	72	90	55
Unknown	794	428	765	348	738	385	685	327
All DP26	1,740	2,057	2,786	1,568	1,444	1,683	2,392	1,345
DP52								
Class 1	312	620	746	454	209	490	627	381
Class 2	18	88	184	82	17	83	178	80
Class 3	22	64	77	34	17	54	67	33
Class 4	3	34	31	19	3	31	31	18
Unknown	305	230	267	187	277	206	245	171
All DP52	660	1,036	1,305	776	523	864	1,148	683
All DPs								
Class 1	18,706	16,859	13,807	8,998	9,216	8,797	7,709	5,017
Class 2	618	968	1,432	630	554	890	1,313	580
Class 3	637	973	1,124	466	597	900	1,036	432
Class 4	591	690	699	366	547	644	663	335
Unknown	5,773	2,444	2,871	1,829	5,465	2,272	2,670	1,748
All Business	26,325	21,934	19,933	12,289	16,379	13,503	13,391	8,112

CMI Occupation Class coded as per In force data

Table 2.6:
Volumes of data by number of analysed events: **Claim Terminations**
Individual Income Protection Standard* data
1991-2006 by quadrennium, by CMI Occupation Class within Deferred Period

Category (DP / Occ Class)	Number of Claimant Recoveries ex Duplicates				Number of Claimant Deaths ex Duplicates			
	91-94	95-98	99-02	03-06	91-94	95-98	99-02	03-06
DP1								
Class 1	6,141	4,789	3,355	2,280	63	48	37	39
Class 2	16	5	8	0	0	0	0	0
Class 3	1	2	0	0	0	0	0	0
Class 4	3	0	0	0	0	0	0	0
Unknown	7	0	0	0	0	0	0	0
All DP1	6,167	4,796	3,363	2,280	63	48	37	39
DP4								
Class 1	1,724	1,268	1,083	780	94	84	62	66
Class 2	578	407	381	235	23	24	28	13
Class 3	1,227	597	642	278	24	24	24	21
Class 4	785	430	332	197	19	14	13	7
Unknown	272	74	29	18	24	10	5	0
All DP4	4,581	2,776	2,467	1,507	184	156	132	107
DP13								
Class 1	464	510	768	651	105	109	155	123
Class 2	187	244	381	305	17	37	51	58
Class 3	208	206	234	184	24	32	22	22
Class 4	216	180	298	208	17	19	25	23
Unknown	451	69	9	29	60	14	2	13
All DP13	1,526	1,209	1,690	1,377	223	211	255	239
DP26								
Class 1	204	325	498	448	92	112	127	130
Class 2	45	74	153	116	10	21	36	26
Class 3	34	56	79	68	11	19	18	12
Class 4	32	42	58	39	2	7	10	5
Unknown	132	34	35	9	47	9	16	13
All DP26	445	531	823	680	162	168	207	186
DP52								
Class 1	35	77	141	137	35	42	38	56
Class 2	8	12	44	55	1	6	8	12
Class 3	6	12	17	24	4	2	2	9
Class 4	5	3	8	17	0	3	4	3
Unknown	38	7	0	1	18	3	0	4
All DP52	92	111	210	234	58	56	52	84
All DPs								
Class 1	8,568	6,969	5,845	4,296	389	395	419	414
Class 2	834	742	967	711	51	88	123	109
Class 3	1,476	873	972	554	63	77	66	64
Class 4	1,041	655	696	461	38	43	52	38
Unknown	900	184	73	57	149	36	23	30
All Business	12,811	9,423	8,553	6,078	690	639	683	655

CMI Occupation Class coded as per Claims data

Table 2.7:
Distribution of data by number of analysed events: **Claim Inceptions**
Individual Income Protection Standard* data
1991-2006 by quadrennium, by CMI Occupation Class within Deferred Period

Category (DP / Occ Class)	Percentage of Claim Inceptions cum Duplicates				Percentage of Claim Inceptions ex Duplicates			
	91-94	95-98	99-02	03-06	91-94	95-98	99-02	03-06
DP1								
Class 1	99	100	100	100	99	100	100	100
Class 2	0	0	0	0	0	0	0	0
Class 3	0	0	0	0	0	0	0	0
Class 4	0	0	0	0	0	0	0	0
Unknown	1	0	0	0	1	0	0	0
All DP1	100	100	100	100	100	100	100	100
DP4								
Class 1	34	48	44	51	29	42	38	45
Class 2	6	8	11	8	6	9	11	8
Class 3	7	12	14	9	8	13	16	10
Class 4	7	9	7	6	7	10	8	7
Unknown	46	22	24	25	50	26	27	30
All DP4	100	100	100	100	100	100	100	100
DP13								
Class 1	29	41	40	40	24	37	37	36
Class 2	6	12	15	12	6	12	16	12
Class 3	4	10	10	7	4	10	10	7
Class 4	4	7	9	7	4	8	9	7
Unknown	58	30	26	35	63	33	28	37
All DP13	100	100	100	100	100	100	100	100
DP26								
Class 1	45	59	53	60	38	55	51	57
Class 2	4	9	11	9	5	11	11	9
Class 3	3	7	6	5	3	7	5	6
Class 4	2	4	3	4	3	4	4	4
Unknown	46	21	27	22	51	23	29	24
All DP26	100	100	100	100	100	100	100	100
DP52								
Class 1	47	60	57	59	40	57	55	56
Class 2	3	8	14	11	3	10	16	12
Class 3	3	6	6	4	3	6	6	5
Class 4	0	3	2	2	1	4	3	3
Unknown	46	22	20	24	53	24	21	25
All DP52	100	100	100	100	100	100	100	100
All DPs								
Class 1	71	77	69	73	56	65	58	62
Class 2	2	4	7	5	3	7	10	7
Class 3	2	4	6	4	4	7	8	5
Class 4	2	3	4	3	3	5	5	4
Unknown	22	11	14	15	33	17	20	22
All Business	100	100	100	100	100	100	100	100

CMI Occupation Class coded as per In force data; figures shown may not sum to 100 due to rounding

Table 2.8:
Distribution of data by number of analysed events: **Claim Terminations**
Individual Income Protection Standard* data
1991-2006 by quadrennium, by CMI Occupation Class within Deferred Period

Category (DP / Occ Class)	Percentage of Claimant Recoveries ex Duplicates				Percentage of Claimant Deaths ex Duplicates			
	91-94	95-98	99-02	03-06	91-94	95-98	99-02	03-06
DP1								
Class 1	100	100	100	100	100	100	100	100
Class 2	0	0	0	0	0	0	0	0
Class 3	0	0	0	0	0	0	0	0
Class 4	0	0	0	0	0	0	0	0
Unknown	0	0	0	0	0	0	0	0
All DP1	100	100	100	100	100	100	100	100
DP4								
Class 1	38	46	44	52	51	54	47	62
Class 2	13	15	15	16	13	15	21	12
Class 3	27	22	26	18	13	15	18	20
Class 4	17	15	13	13	10	9	10	7
Unknown	6	3	1	1	13	6	4	0
All DP4	100	100	100	100	100	100	100	100
DP13								
Class 1	30	42	45	47	47	52	61	51
Class 2	12	20	23	22	8	18	20	24
Class 3	14	17	14	13	11	15	9	9
Class 4	14	15	18	15	8	9	10	10
Unknown	30	6	1	2	27	7	1	5
All DP13	100	100	100	100	100	100	100	100
DP26								
Class 1	46	61	61	66	57	67	61	70
Class 2	10	14	19	17	6	13	17	14
Class 3	8	11	10	10	7	11	9	6
Class 4	7	8	7	6	1	4	5	3
Unknown	30	6	4	1	29	5	8	7
All DP26	100	100	100	100	100	100	100	100
DP52								
Class 1	38	69	67	59	60	75	73	67
Class 2	9	11	21	24	2	11	15	14
Class 3	7	11	8	10	7	4	4	11
Class 4	5	3	4	7	0	5	8	4
Unknown	41	6	0	0	31	5	0	5
All DP52	100	100	100	100	100	100	100	100
All DPs								
Class 1	67	74	68	71	56	62	61	63
Class 2	7	8	11	12	7	14	18	17
Class 3	12	9	11	9	9	12	10	10
Class 4	8	7	8	8	6	7	8	6
Unknown	7	2	1	1	22	6	3	5
All Business	100	100	100	100	100	100	100	100

CMI Occupation Class coded as per Claims data; figures shown may not sum to 100 due to rounding

3. CLAIM INCEPTIONS EXPERIENCE

The methodology for analysing the Claim Inceptions experience of IP business is set out in Section 3.4 of CMI Working Paper 59. The basic approach is to compare actual Claim Inceptions with those expected using the Sickness graduations IPM 1991-98 which reflect the experience of Individual Income Protection *Standard** business for males in CMI Occupation Class 1 over the period 1991-98.

In the Claim Inceptions analyses, the CMI Occupation Class is coded as per the In force data. This is detailed more fully in Section 2.4.

Duplicates can be identified in the Claims data, for the count of actual Claim Inceptions, but not in the In force data used in the calculation of the exposed-to-risk and expected Inceptions. This is detailed more fully in Section 2.5. For this analysis, actual Claim Inceptions are counted ex Duplicates, and the ex Duplicate exposed-to-risk is estimated by scaling down the calculated cum Duplicates value. For each data cell (defined by Age, Sex, Year, Deferred Period and Occupation Class) the cum Duplicates exposed-to-risk is scaled by the ratio (smoothed across neighbouring cells by Age) of the Claim Inceptions count excluding Duplicates to the Claim Inceptions count including Duplicates.

The results of the analysis are presented as a series of tables in a spreadsheet (MS Office Excel workbook) issued alongside this Working Paper. A full description of the content and format of the results tables is provided in Section 4 of CMI Working Paper 59 and an overview of the statistical tests used in the analysis is provided in Section 5 of that Paper. In summary, the tables presenting the Claim Inceptions experience provide the following information:

- Tables **I.m.1** to **I.m.6** show summary results for CMI Occupation Classes 1 to 4, Class Unknown (5) and all Classes combined (6) respectively. The tables show information separately for each of the Deferred Periods 1, 4, 13, 26 and 52 weeks:
  - Totals for exposure and for actual and expected Claim Inceptions
  - $100 \times A/E$ for all ages and by 5-year age groups
  - An array of statistical tests to determine whether the experience might reasonably be described as being consistent with the basis for expected Inceptions, IPM 1991-98, or with a simple multiple of that basis.

- Tables **I.f.1** to **I.f.6** show the corresponding results for females.

- Tables **I.m.1.01** to **I.m.6.52** (30 tables in all) provide additional detail, by 5-year age groups, for each combination of CMI Occupation Class (1 to 4, 5 = Unknown, 6 = All, as above) and Deferred Period (01, 04, 13, 26 and 52 weeks):
  - Exposure and actual Claim Inceptions cum Duplicates
  - Actual and expected Claim Inceptions ex Duplicates
  - $100 \times A/E$ and $100 \times A/E^*$ where $E^* = E$ multiplied by the all-age $\Sigma A/\Sigma E$, so that $\Sigma E^* = \Sigma A$ in each Table. The statistical tests noted above are conducted using both E and E^*. The purpose of this dual statistical analysis is to indicate whether any lack of fit relates only to the level of the comparison basis rather than to its "shape" by age.

- Tables **I.f.1.01** to **I.f.6.52** (30 tables in all) show the corresponding results for females.

This Paper concentrates on the experience of the quadrennium 2003-06. However, it is helpful to compare this experience with that of previous quadrennia. As this is the first Paper to present results using IPM 1991-98 as the basis for expected Claim Inceptions, the experiences for 1991-94, 1995-98 and 1999-2002 have been reworked on this basis and the results issued, also in spreadsheet format, alongside this Working Paper.

The results are summarised in Table 3.1 for males and Table 3.2 for females. The Tables show the progression across the 4 quadrennia, covering 1991-2006, of all age $100 \times A/E$ for each Occupation Class and Deferred Period.

As noted in Section 2.6, the data available for Occupation Classes 2 – 4 for some Deferred Periods, and for females in particular, is relatively sparse. As the $100 \times A/E$ results in the summary Tables are shown without the corresponding A or E, some additional formatting has been applied to prevent undue emphasis being placed on results based on low volumes of data: $100 \times A/E$ values based on fewer than 30 actual Claim Inceptions are shown in *italics*; no results are shown for cells where there are fewer than 10 actual Claim Inceptions (exD).

These high-level results are also shown graphically in Figures 3.1 – 3.7 at the end of this Section, facilitating a range of comparisons by quadrennium, Sex, CMI Occupation Class and Deferred Period.

In addition to the $100 \times A/E$ results shown in the Tables, the Figures also illustrate approximate 95% confidence intervals of +/–1.96 standard deviations for each observed data point. It is assumed here that the user wishes to estimate the level of the observed experience relative to the comparison basis (rather than test whether the experience may be said to conform to the comparison basis), and so to estimate $100 \times r$ where the parameter r is the constant multiplier which would need to be applied to the number of expected Claim Inceptions (in each data cell) in order to match the overall level of the observed experience. For this purpose, the best estimate is $100 \times A/E$ and the standard deviation, σ, is estimated as $100 \times \sqrt{A}/E$, giving a lower bound of $100 \times (A - 1.96\sqrt{A})/E$ and an upper bound of $100 \times (A + 1.96\sqrt{A})/E$.

The key features emerging from the experience are as follows:

- The All Office experience shows that Claim Inception rates have fallen significantly between 1999-2002 and 2003-06 for both males and females for all Deferred Periods. For DP1, DP4 and DP13, this continues the reducing trend observed from previous quadrennia back to at least 1991-94. For DP26 and DP52 this follows a less consistent pattern from previous quadrennia, although there is still a general downward trend for these Deferred Periods.

- At an overall level, the scale of the reduction in Claim Inception rates for males, from 1999-2002 to 2003-06, is greater the longer the Deferred Period, and this pattern is loosely followed for each of the Occupation Classes. The relative improvement in overall Claim Inceptions experience is also larger for DP26 and DP52 than for the shorter Deferred Periods for females.

- Looking at the movement in Claim Inception rates by Deferred Period:
  - For DP1 business, which is almost entirely Occupation Class 1 business, Inception rates for males and females have reduced each quadrennium between 1991-94 and 2003-06.
  - For DP4 business, the reduction in Inception rates can be seen across all quadrennia and all Occupation Classes. The minor exception to this is male Occupation Class 3, which, despite showing reductions from 1991-94 to 1999-2002, shows a small (and not statistically significant) increase in Claim Inception rates in the most recent quadrennium.
  - The DP13 business displays similar experience trends to the DP1 and DP4 business in that Inception rates have decreased across all quadrennia and all Occupation Classes, with only minor (and not statistically significant) exceptions.
  - The experience for 2003-06 shows a reduction in Inception rates for DP26 and DP52 business, across all Occupation Classes, compared with the experience for the previous quadrennium. This continues a general trend of reducing Inception rates between 1991-94 and 1999-2002, although there has been some variation in this, with certain Occupation Classes showing increased Inception rates over particular periods.
  - The Occupation Class Unknown category is showing particularly large reductions from 1999-02 to 2003-06 for Claim Inceptions rates both DP26 and DP52 business. For DP26 these reductions seem to be ironing out the curious 1999-02 results which showed a large increase in Inception rates relative to experience of the preceding quadrennium (but this feature is not so evident for DP52).

Readers should exercise caution when attempting to draw conclusions about underlying trends from these results. As discussed in previous reports (see for example CMIR22), there is considerable variation of experience between offices and the combined results can be influenced by changes in the mix of offices contributing from year to year and quadrennium to quadrennium. Other factors may also mask any trends in the underlying morbidity experience, for example changes to underwriting practices and claims management procedures.

Table 3.1:
Comparison of **actual Claims Inceptions** with those **expected using IPM 1991-98;**
Individual Income Protection Standard* experience for **Males;**
1991-2006 by quadrennium, CMI Occupation Class and Deferred Period; all ages combined.

		100 × *A*/*E* Claim Inceptions using IPM 1991-98				
Occupation Class	Quadrennium	DP1	DP4	DP13	DP26	DP52
Class 1	91-94	104	108	115	103	101
	95-98	100	99	99	108	113
	99-02	88	74	84	89	93
	03-06	77	69	60	70	64
Class 2	91-94	-	165	186	106	*125*
	95-98	-	106	116	94	145
	99-02	-	85	126	100	97
	03-06	-	73	78	65	63
Class 3	91-94	-	234	255	145	*279*
	95-98	-	119	174	157	180
	99-02	-	90	142	150	129
	03-06	-	94	89	96	*71*
Class 4	91-94	-	335	327	228	-
	95-98	-	222	206	186	301
	99-02	-	144	182	146	*114*
	03-06	-	136	112	111	*73*
Class Unknown	91-94	60	160	146	100	99
	95-98	-	81	122	121	121
	99-02	-	86	116	183	124
	03-06	-	57	78	69	52
All Business	91-94	103	153	145	104	103
	95-98	98	103	121	115	125
	99-02	86	85	110	112	103
	03-06	77	70	74	72	62

Values based on fewer than 30 actual Claim Inceptions (exD) are shown in *italic*;
no results are shown for cells where there are fewer than 10 actual Claim Inceptions (exD).

Table 3.2:
Comparison of **actual Claims Inceptions** with those **expected using IPM 1991-98;**
Individual Income Protection Standard* experience for **Females;**
1991-2006 by quadrennium, CMI Occupation Class and Deferred Period; all ages combined.

		100 × *A*/*E* Claim Inceptions using IPM 1991-98				
Occupation Class	Quadrennium	DP1	DP4	DP13	DP26	DP52
Class 1	91-94	125	202	252	246	185
	95-98	126	141	165	197	198
	99-02	93	86	140	184	159
	03-06	70	87	125	128	135
Class 2	91-94	-	279	391	*443*	-
	95-98	-	150	237	269	222
	99-02	-	112	193	211	207
	03-06	-	90	130	122	128
Class 3	91-94	-	*473*	-	-	-
	95-98	-	*230*	*258*	*365*	*371*
	99-02	-	-	*134*	*236*	*110*
	03-06	-	*146*	*134*	*106*	*94*
Class 4	91-94	-	-	-	-	-
	95-98	-	-	-	-	-
	99-02	-	-	*271*	-	-
	03-06	-	-	-	-	-
Class Unknown	91-94	-	195	208	309	234
	95-98	-	116	193	203	287
	99-02	-	120	189	422	246
	03-06	-	69	127	121	102
All Business	91-94	125	209	238	285	214
	95-98	125	139	185	211	222
	99-02	92	95	161	226	176
	03-06	70	83	126	125	121

Values based on fewer than 30 actual Claim Inceptions are shown in *italic*;
no results are shown for cells where there are fewer than 10 actual Claim Inceptions.

The experience results for male insured lives may be compared directly those of females since both use the same basis, IPM 1991-98, based on male, *Standard**, Occupation Class 1 business for 1991-98, as a comparison basis for calculating *A*/*E*s. They can be compared using Figures 3.1 – 3.7. A summary comparison is shown in Table 3.3 below. This shows, for each Deferred Period, the 100 × *A*/*E* value for females expressed as a percentage of the 100 × *A*/*E* value for males in each of the four quadrennia. This is shown only for CMI Occupation Class 1 and for all Classes combined as there is little data for females in Occupation Classes 2-4.

Table 3.3:
Comparison of Claim Inceptions experience for females with that of males using *A*/*E* measure of actual Claim Inceptions over those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience
for Occupation Class 1 and all Classes combined**;**
1991-2006 by quadrennium and Deferred Period; all ages combined.

		100 × Female *A*/*E* ÷ Male *A*/*E*			
Deferred Period	Occupation Class	91-94 %	95-98 %	99-02 %	03-06 %
DP1	Class 1	121	126	106	91
	All DP1	121	127	107	91
DP4	Class 1	188	142	116	126
	All DP4	137	135	111	119
DP13	Class 1	218	166	167	207
	All DP13	164	153	146	171
DP26	Class 1	240	182	206	182
	All DP26	273	184	201	174
DP52	Class 1	182	175	171	210
	All DP52	208	178	172	197

Table 3.3 shows a broadly consistent pattern, over all four quadrennia, of Claim Inceptions experience for females being significantly heavier than experience for male for all Deferred Periods. However, for the first time in the Investigation, an exception has occurred in that the DP1 experience for the 2003-06 quadrennium shows lighter Claim Inception rates for females than males.

The differential in observed Claim Inception rates by Sex is considerable for the three longest Deferred Periods with Inception rates for females being roughly double those for males for DP13, DP26 and DP52. There is some evidence of a reduction of the observed male-female Claim rate differentials since 1991-94, particularly for the shorter Deferred Periods.

Another area where marked differentials in Claim Inceptions experience can be observed is between CMI Occupation Classes. Again these differentials can be studied in graphical form in Figures 3.3 – 3.7. An alternative, summary presentation is shown in Table 3.4. This shows, for each Deferred Period, the 100 × *A*/*E* value for each CMI Occupation Class expressed as a proportion of the 100 × *A*/*E* value for Class 1 business for each of the four

quadrennia. The Table covers males only as there is relatively little data for females in Classes 2-4.

Table 3.4:
Comparison of Claim Inceptions experience for other Occupation Classes with Class 1 using *A*/*E* measure of actual Claim Inceptions over those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Males** only**;**
1991-2006 by quadrennium and Deferred Period; all ages combined.

		100 × Occupation Class *A*/*E* ÷ Class 1 *A*/*E*			
Deferred Period	Occupation Class	91-94 %	95-98 %	99-02 %	03-06 %
DP1	Class 1	100	100	100	100
	Class 2	-	-	-	-
	Class 3	-	-	-	-
	Class 4	-	-	-	-
	Unknown	58	-	-	-
	All DP1	99	99	98	100
DP4	Class 1	100	100	100	100
	Class 2	153	107	114	106
	Class 3	217	120	122	136
	Class 4	312	224	194	198
	Unknown	148	82	116	83
	All DP4	142	104	115	101
DP13	Class 1	100	100	100	100
	Class 2	161	117	151	130
	Class 3	221	175	169	148
	Class 4	283	207	217	186
	Unknown	126	122	138	129
	All DP4	126	122	131	122
DP26	Class 1	100	100	100	100
	Class 2	103	87	112	92
	Class 3	141	145	168	136
	Class 4	222	172	164	158
	Unknown	97	112	204	99
	All DP26	102	106	126	103
DP52	Class 1	100	100	100	100
	Class 2	*124*	128	104	98
	Class 3	*276*	158	139	*111*
	Class 4	-	265	*122*	*113*
	Unknown	98	107	133	81
	All DP52	101	110	110	95

Values based on fewer than 30 actual Claim Inceptions are shown in *italic*;
no results are shown for cells where there are fewer than 10 actual Claim Inceptions.

The tendency, across all four quadrennia, is for Claim Inceptions experience to become heavier from Class 1 to Class 4. However, this gradient in Inception rates by Occupation Class appears to have to become significantly shallower over 1991-94 to 2003-06. This is most evident at the shorter DPs, although it should be remembered that the volumes of data underlying some cells of the Table are low, particularly at the longer DPs.

Figure 3.1:
Comparison of **actual Claim Inceptions** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **CMI Occupation Class 1**;
1991-2006 by quadrennium, Sex and Deferred Period; all ages combined.

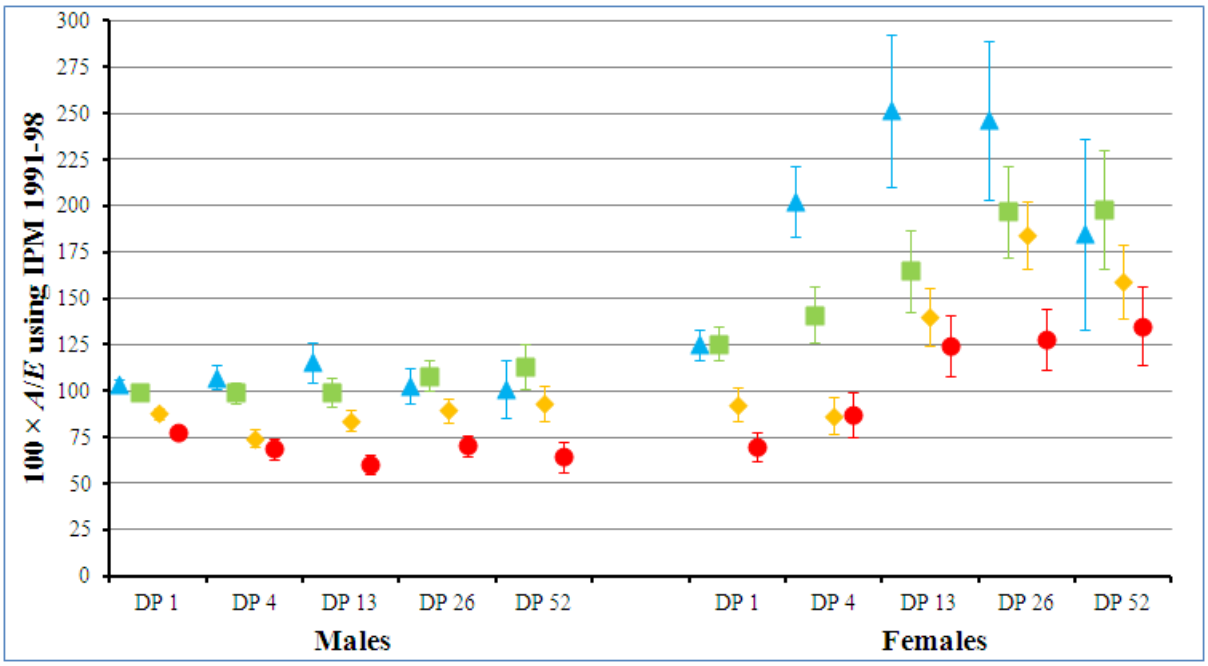
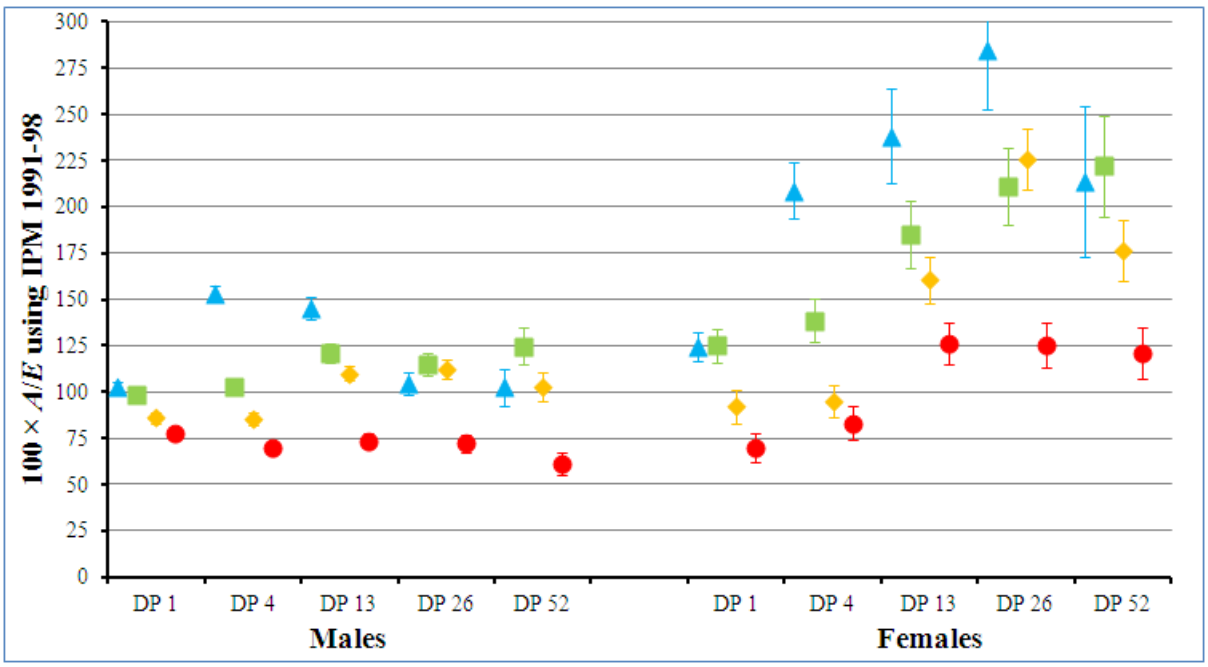


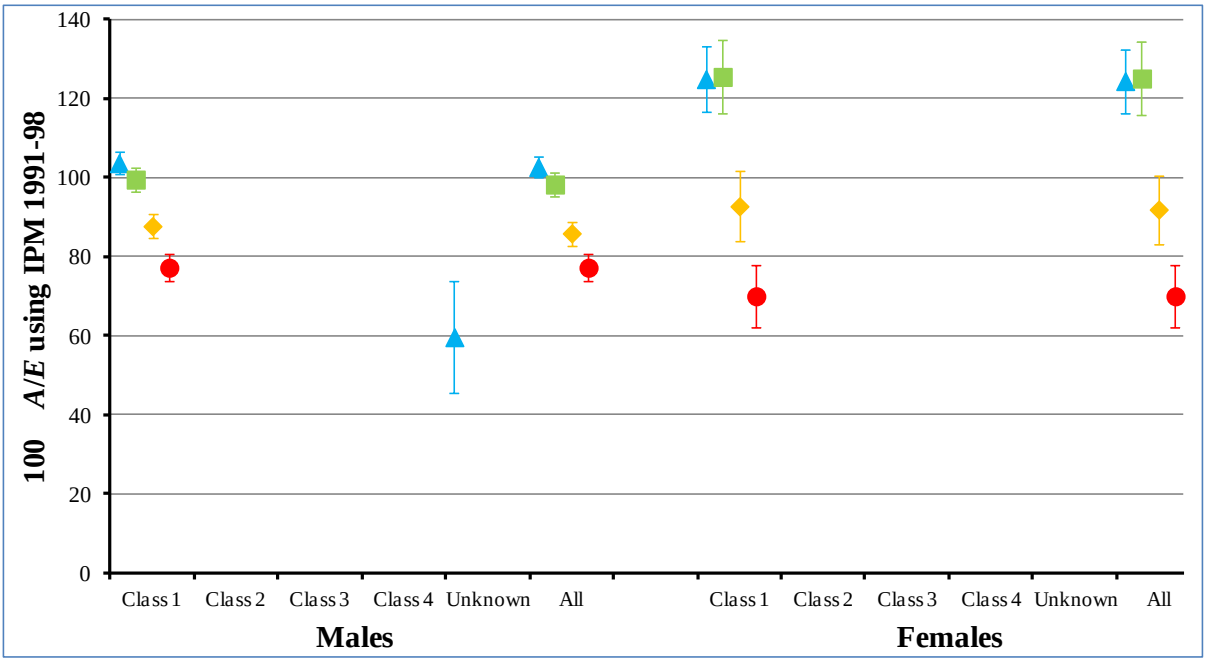
Figure 3.2:
Comparison of **actual Claim Inceptions** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **All Occupation Classes combined**;
1991-2006 by quadrennium, Sex and Deferred Period; all ages combined.



▲ 1991-94 ■ 1995-98 ◆ 1999-02 ● 2003-06

The error bars show approximate 95% confidence intervals, $100 \times A/E \pm 1.96\sigma$, where $\sigma = 100 \times \sqrt{A}/E$.
Data points based on fewer than 10 actual Claim Inceptions are omitted from the above Figures.

Figure 3.3:
Comparison of **actual Claims Inceptions** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 1 week**;
1991-2006 by quadrennium, Sex and CMI Occupation Class; all ages combined.



▲ 1991-94 ■ 1995-98 ◆ 1999-02 ● 2003-06

The error bars show approximate 95% confidence intervals, $100 \times A/E \pm 1.96\sigma$, where $\sigma = 100 \times \sqrt{A}/E$.
Data points based on fewer than 10 actual Claim Inceptions are omitted from the above Figures.

Figure 3.4:
Comparison of **actual Claim Inceptions** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 4 weeks**;
1991-2006 by quadrennium, Sex and CMI Occupation Class; all ages combined.

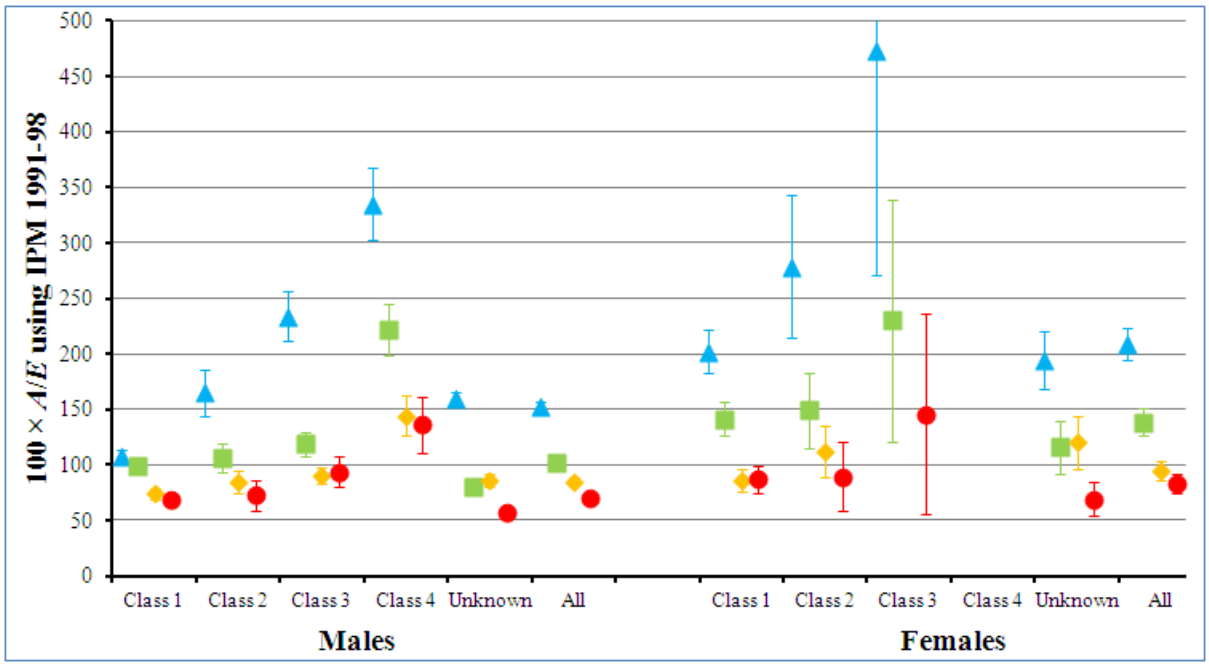
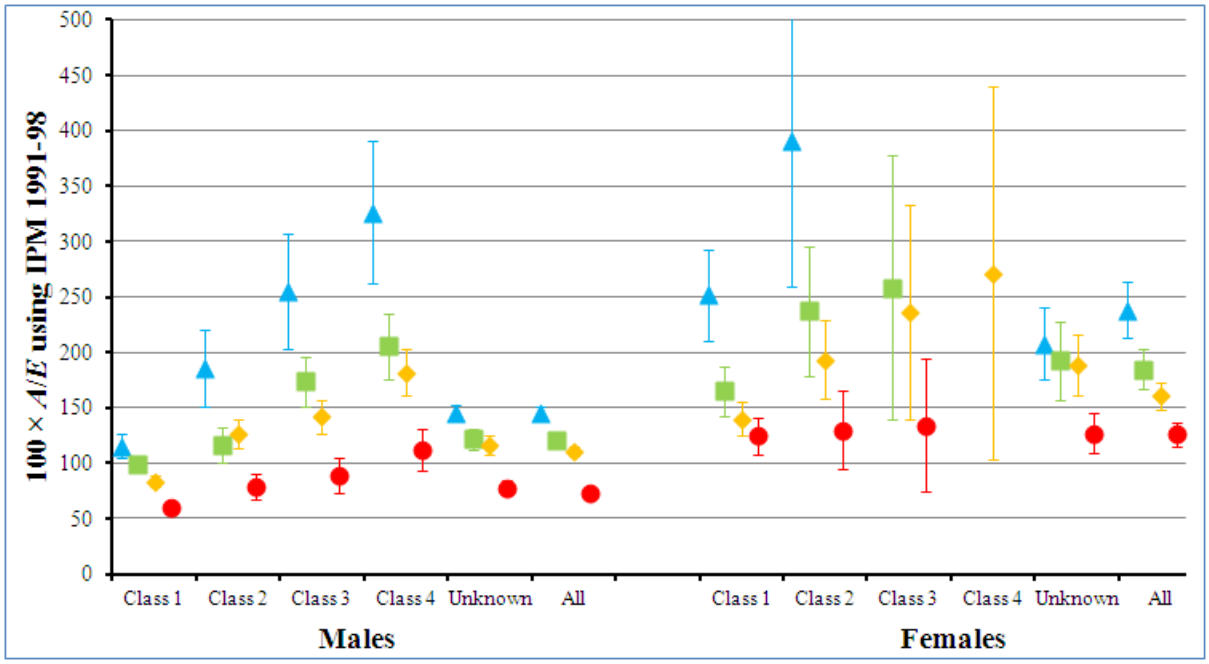


Figure 3.5:
Comparison of **actual Claim Inceptions** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 13 weeks**;
1991-2006 by quadrennium, Sex and CMI Occupation Class; all ages combined.



▲ 1991-94 ■ 1995-98 ◆ 1999-02 ● 2003-06

The error bars show approximate 95% confidence intervals, $100 \times A/E \pm 1.96\sigma$, where $\sigma = 100 \times \sqrt{A}/E$.
Data points based on fewer than 10 actual Claim Inceptions are omitted from the above Figures.

Figure 3.6:
Comparison of **actual Claim Inceptions** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 26 weeks**;
1991-2006 by quadrennium, Sex and CMI Occupation Class; all ages combined.

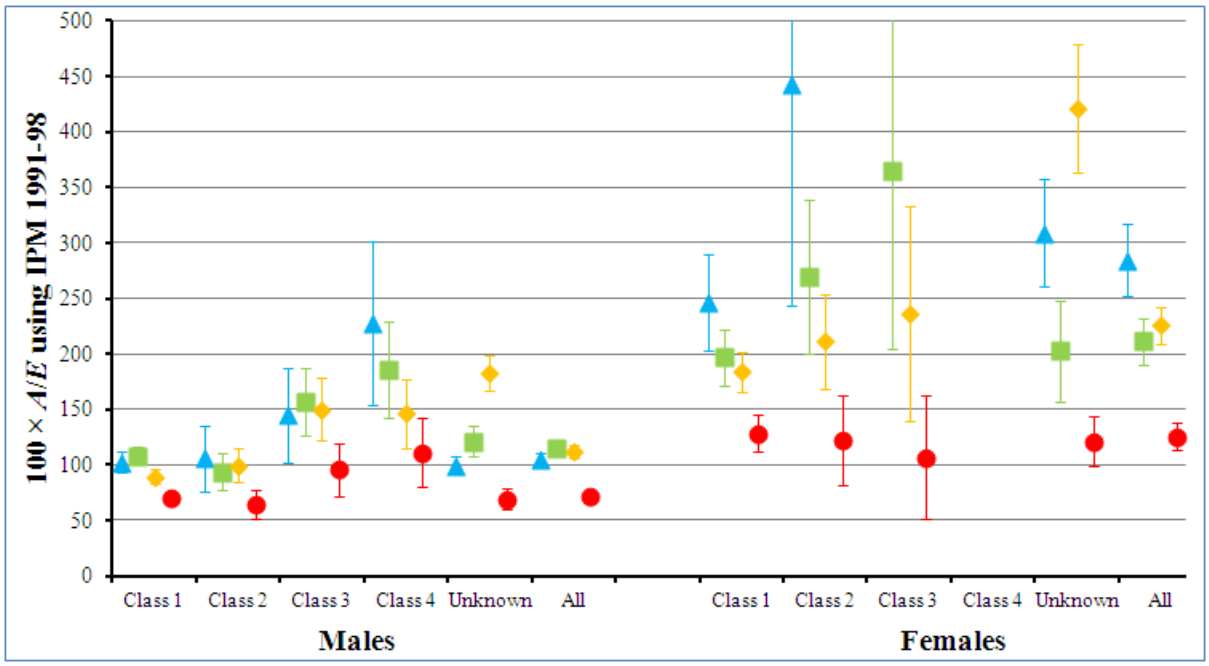
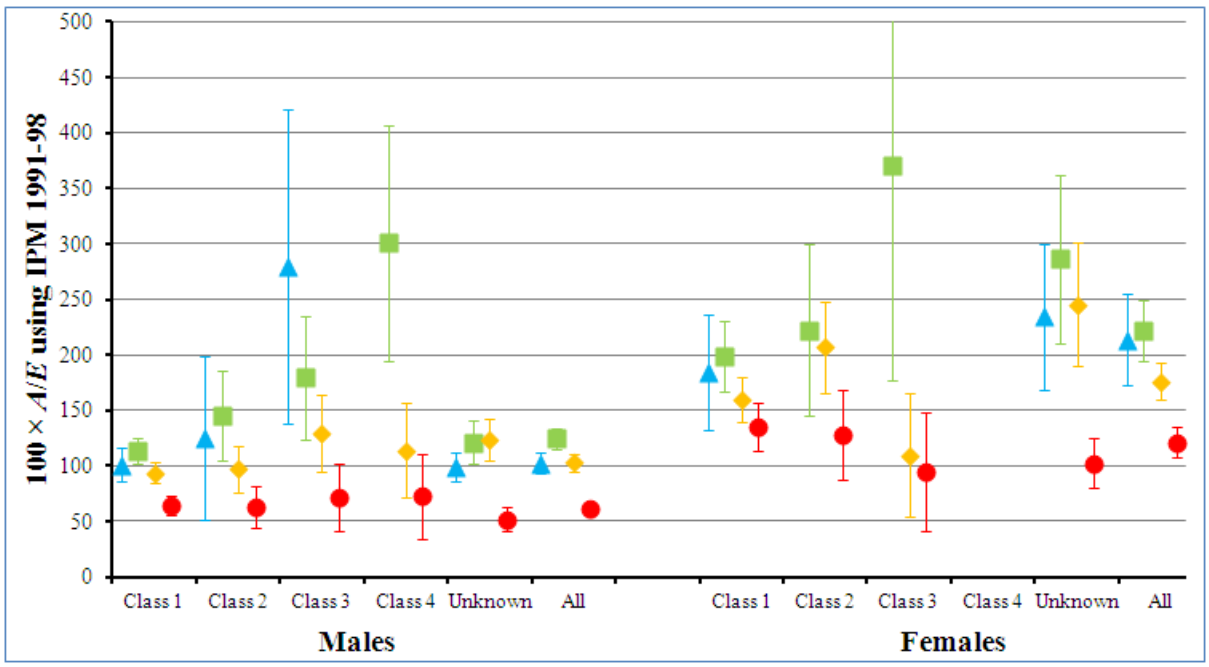


Figure 3.7:
Comparison of **actual Claim Inceptions** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 52 weeks**;
1991-2006 by quadrennium, Sex and CMI Occupation Class; all ages combined.



▲ 1991-94 ■ 1995-98 ◆ 1999-02 ● 2003-06

The error bars show approximate 95% confidence intervals, $100 \times A/E \pm 1.96\sigma$, where $\sigma = 100 \times \sqrt{A}/E$.
Data points based on fewer than 10 actual Claim Inceptions are omitted from the above Figures.

4. CLAIM TERMINATIONS EXPERIENCE

The methodology for analysing the Claim Terminations experience of IP business is set out in Section 3.5 of CMI Working Paper 59. The basic approach is to compare actual Claim Terminations with those expected using the Sickness graduations IPM 1991-98 which reflect the experience of Individual Income Protection *Standard** business for males in CMI Occupation Class 1 over the period 1991-98. Claimant Recoveries and Deaths are analysed separately.

In the Claim Terminations analyses, which use only the Claims data, the Occupation Class is coded as per the Claims data and Duplicates are excluded. This is detailed more fully in Sections 2.4 and 2.5.

The results of the analysis are presented as a series of tables in a spreadsheet (MS Office Excel workbook) issued alongside this Working Paper. A full description of the content and format of the results tables is provided in Section 4 of CMI Working Paper 59 and an overview of the statistical tests used in the analysis is provided in Section 5 of that Paper. In summary, the tables presenting the Claim Terminations experience provide the following information:

- Tables **R.m.1** to **R.m.6** show summary results for CMI Occupation Classes 1 to 4, Class Unknown (5) and all Classes combined (6) respectively. The tables show information separately for each of the Deferred Periods 1, 4, 13, 26 and 52 weeks, for DPs 4 – 52 combined, and for all DPs combined:
  - Totals for actual and expected Claimant Recoveries.
  - $100 \times A/E$ for all ages and all durations Sick combined.
  - $100 \times A/E$ for specified intervals of duration Sick (for all ages combined).
  - $100 \times A/E$ for 5-year age groups (for all durations Sick combined).
  - An array of statistical tests results to determine whether the experience might reasonably be described as being consistent with the basis for expected Recoveries, IPM 1991-98, or with a simple multiple of that basis.
  - The statistical tests are conducted using both E and E^*, where $E^* = E$ multiplied by the all-age, all-durations Sick $\Sigma A/\Sigma E$, so that $\Sigma E^* = \Sigma A$ in each Table. The purpose of this dual statistical analysis is to indicate whether any lack of fit relates only to the level of the comparison basis rather than to its "shape" by age or duration Sick.

- Tables **R.f.1** to **R.f.6** show the corresponding results for females.

- Tables **D.m.1** to **D.m.6** show the equivalent analysis of Claimant Deaths for males.

- Tables **D.f.1** to **D.f.6** show the equivalent analysis of Claimant Deaths for females.

This Paper concentrates on the experience of the quadrennium 2003-06. However, it is helpful to compare this experience with that of previous quadrennia. As this is the first Paper to present results using IPM 1991-98 as the basis for expected Claim Terminations, the experiences for 1991-94, 1995-98 and 1999-2002 have been reworked on this basis and the results issued, also in spreadsheet format, alongside this Working Paper.

The results for Claimant Recoveries are summarised in Table 4.1 for males and Table 4.2 for females; likewise the results for Claimant Deaths are summarised in Tables 4.3 and 4.4. The

Tables show the progression across the 4 quadrennia, covering 1991-2006, of all age $100 \times A/E$ for each CMI Occupation Class and Deferred Period.

As noted in Section 2.6, the data available for CMI Occupation Classes 2 – 4 for some Deferred Periods, and for females in particular, is relatively sparse, and the number of Claimant Deaths is much lower than the number of Claimant Recoveries across the board. As the $100 \times A/E$ results in the summary Tables are shown without the corresponding A or E, some additional formatting has been applied to prevent undue emphasis being placed on results based on low volumes of data: $100 \times A/E$ values based on fewer than 30 actual Claim Terminations are shown in *italics*; no results are shown for cells where there are fewer than 10 actual Claim Terminations.

These high-level results are also shown graphically in Figures 4.1 – 4.8 for Claimant Recoveries, and Figures 4.9 – 4.16 for Claimant Deaths, facilitating a range of comparisons by quadrennium, Sex, Occupation Class and Deferred Period.

In addition to the $100 \times A/E$ results shown in the Tables, the Figures also illustrate approximate 95% confidence intervals of +/–1.96 standard deviations for each observed data point. It is assumed here that the user wishes to estimate the level of the observed experience relative to the comparison basis (rather than test whether the experience may be said to conform to the comparison basis), and so to estimate $100 \times r$ where the parameter r is the constant multiplier which would need to be applied to the number of expected Claim Terminations (in each data cell) in order to match the overall level of the observed experience. For this purpose, the best estimate is $100 \times A/E$ and the standard deviation, σ, is estimated as $100 \times \sqrt{A}/E$, giving a lower bound of $100 \times (A - 1.96\sqrt{A})/E$ and an upper bound of $100 \times (A + 1.96\sqrt{A})/E$.

The following features are apparent:

- Overall Claimant Recovery experience has improved with observed rates for 2003-06 being 10% - 20% higher than those for 1999-2002. This is in contrast to previous quadrennia, where Recovery rates had decreased between 1991-94 and 1999-2002. For males, Recovery rates have increased for each Deferred Period, with the relative increase becoming larger the longer the Deferred Period. For females, Recovery rates have decreased for DP1 in the most recent quadrennium, but for the other Deferred Periods the pattern is similar to that seen for males in that the Recovery rates have increased and the degree of increase is greater the longer the Deferred Period.

- Looking at the movement in Claimant Recovery rates by Deferred Period:
  - For DP1 business, which is virtually all Class 1, Recovery rates for males have slightly increased from 1999-2002, continuing the trend from previous quadrennia. For females, Recovery rates have fallen significantly in the most recent quadrennia, following a small increase in observed rates from 1995-98 to 1999-2002.
  - For DP4 business, overall Recovery rates for both males and females have increased in the most recent quadrennia following decreases from 1991-94 to 1995-98 and then again from 1995-98 to 1999-02. This reflects the Class 1 experience – there is no consistent pattern for the other Occupation Classes.

- For DP13 business, overall Recovery rates for all Occupation Classes have increased from 1999-2002 to 2003-06. This follows reductions from 1995-98 to 1999-2002 for both males and females for all Occupation Classes, apart from Class 4.
- For DP26 business, there is a large increase in overall Recovery rates for both males and females from 1999-2002 to 2003-06. The increasing trend over the most recent quadrennia can be seen in all Occupation Classes except the female Occupation Class 4 (where data is sparse). This follows a general reducing trend from 1991-94 to 1999-2002.
- For DP52 business, the pattern of overall Recovery rates is similar for males and females in that they decreased from 1991-94 to 1995-98, but then have increased by a considerable amount from both 1995-98 to 1999-2002 and 1999-2002 to 2003-06. Most Occupation Classes show an increase in recovery rates from 1999-2002 to 2003-06 except for the females Occupation Class 4 where the data is sparse.

- Overall Recovery rates for female Claimants appear to be lower than those for males for DP1, DP4 and DP13, but higher for DP26 and DP52. This pattern is heavily influenced by the Occupation Class 1 business as the position for the other classes is less clear.

- As in the previous quadrennia, there seems little sign of a clear pattern for Recovery rates by Occupation Class. Note that the "all Deferred Periods" comparison may be distorted by the large amount of DP1 business, which is heavily weighted with short duration Claims, in the Occupation Class 1 data.

Examination of the overall Claimant Recovery results by duration of Sickness and Age at start of Sickness shows that the pattern of experience may have changed since 1991-98 as well as the overall level. For both males and females, the experience for 2003-06 generally shows higher *A*/*E*s at older ages and longer durations Sick, and correspondingly lower *A*/*E*s at younger ages and earlier durations of Sickness.

Data for Claimant Deaths is generally sparse and observation confidence intervals are consequently large, particularly for females and Occupation Classes other than Class 1. From 1991-94 to 1999-2002, Claimant Death rates fell across most Deferred Periods, and for all DPs combined, for both males and females. However, the most recent quadrennium shows an unexpected reversal of this trend with an increase in Death rates for both males and females across all Deferred Periods (apart from female DP1 where the data are very sparse).

Overall, the ratio of Claimant Deaths rates for females is around 70% to 80% of that for males.

Again, readers are cautioned about the effect of changing office mix and other factors when comparing the experience of different time periods.

Table 4.1:
Comparison of **actual Claimant Recoveries** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Males**;
1991-2006 by quadrennium, CMI Occupation Class and Deferred Period;
all ages and durations Sick combined.

		100 × *A*/*E* Claimant Recoveries using IPM 1991-98					
CMI Occupation Class	Quadrennium	DP1	DP4	DP13	DP26	DP52	All DP
Class 1	91-94	101	112	114	103	*103*	104
	95-98	103	96	96	101	100	101
	99-02	103	96	94	98	140	101
	03-06	106	107	123	135	158	111
Class 2	91-94	*55*	92	112	*103*	-	95
	95-98	-	91	114	80	-	96
	99-02	-	72	99	105	*72*	85
	03-06	-	95	142	153	*226*	124
Class 3	91-94	-	95	119	*87*	-	98
	95-98	-	96	102	93	*100*	97
	99-02	-	94	87	92	*62*	91
	03-06	-	100	128	122	*114*	110
Class 4	91-94	-	96	113	132	-	100
	95-98	-	101	98	129	-	101
	99-02	-	109	117	91	-	110
	03-06	-	121	149	143	*327*	137
Class Unknown	91-94	-	109	154	140	327	135
	95-98	-	103	96	*125*	-	104
	99-02	-	*117*	-	*87*	-	95
	03-06	-	*116*	*288*	-	-	185
All Business	91-94	101	100	125	112	162	104
	95-98	103	96	101	100	97	100
	99-02	103	93	98	97	109	98
	03-06	106	105	134	138	176	114

Values based on fewer than 30 actual Claimant Recoveries are shown in *italic*;
no results are shown for cells where there are fewer than 10 actual Claimant Recoveries.

Table 4.2:
Comparison of **actual Claimant Recoveries** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Females**;
1991-2006 by quadrennium, CMI Occupation Class and Deferred Period;
all ages and durations Sick combined.

		100 × *A*/*E* Claimant Recoveries using IPM 1991-98					
CMI Occupation Class	Quadrennium	DP1	DP4	DP13	DP26	DP52	All DP
Class 1	91-94	92	107	111	96	*132*	98
	95-98	86	98	100	111	114	93
	99-02	93	80	90	109	107	92
	03-06	74	92	108	150	190	99
Class 2	91-94	-	84	99	*120*	-	88
	95-98	-	89	90	98	-	89
	99-02	-	61	68	96	150	74
	03-06	-	67	107	194	*231*	109
Class 3	91-94	-	102	-	-	-	104
	95-98	-	*50*	*101*	-	-	66
	99-02	-	*98*	*51*	*98*	-	84
	03-06	-	*68*	*152*	*224*	*215*	145
Class 4	91-94	-	-	-	-	-	-
	95-98	-	-	-	-	-	-
	99-02	-	-	*101*	-	-	*123*
	03-06	-	-	*221*	-	-	*188*
Class Unknown	91-94	-	*109*	148	*158*	-	146
	95-98	-	-	-	*99*	-	*92*
	99-02	-	-	-	*85*	-	*74*
	03-06	-	-	-	-	-	*272*
All Business	91-94	92	101	115	111	*156*	99
	95-98	86	92	96	105	97	91
	99-02	93	75	81	105	123	88
	03-06	74	85	114	162	202	104

Values based on fewer than 30 actual Claimant Recoveries are shown in *italic*;
no results are shown for cells where there are fewer than 10 actual Claimant Recoveries.

Table 4.3:
Comparison of **actual Claimant Deaths** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Males**;
1991-2006 by quadrennium, CMI Occupation Class and Deferred Period;
all ages and durations Sick combined.

		100 × *A/E* Claimant Deaths using IPM 1991-98					
CMI Occupation Class	Quadrennium	DP1	DP4	DP13	DP26	DP52	All DP
Class 1	91-94	109	105	126	98	130	111
	95-98	85	86	102	95	82	92
	99-02	70	68	94	67	*39*	72
	03-06	96	97	103	87	89	95
Class 2	91-94	-	*89*	*68*	-	-	72
	95-98	-	*99*	88	*74*	-	86
	99-02	-	*94*	73	97	-	80
	03-06	-	*81*	118	*97*	-	100
Class 3	91-94	-	*40*	*79*	*84*	-	58
	95-98	-	*55*	*78*	*89*	-	67
	99-02	-	*45*	*37*	*60*	-	42
	03-06	-	*82*	*69*	*66*	-	75
Class 4	91-94	-	*54*	*58*	-	-	52
	95-98	-	*54*	*51*	-	-	56
	99-02	-	*61*	*53*	*56*	-	57
	03-06	-	-	*85*	-	-	70
Class Unknown	91-94	-	*126*	101	119	*159*	115
	95-98	-	*111*	*87*	-	-	95
	99-02	-	-	-	*111*	-	*98*
	03-06	-	-	*333*	*430*	-	*306*
All Business	91-94	107	80	97	94	121	93
	95-98	84	77	86	89	76	83
	99-02	69	66	73	72	37	67
	03-06	96	85	103	90	91	94

Values based on fewer than 30 actual Claimant Deaths are shown in italic;
no results are shown for cells where there are fewer than 10 actual Claimant Deaths.

Table 4.4:
Comparison of **actual Claimant Deaths** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Females**;
1991-2006 by quadrennium, CMI Occupation Class and Deferred Period;
all ages and durations Sick combined.

		100 × *A/E* Claimant Deaths using IPM 1991-98					
CMI Occupation Class	Quadrennium	DP1	DP4	DP13	DP26	DP52	All DP
Class 1	91-94	-	-	*74*	*98*	-	70
	95-98	-	*68*	-	*37*	-	45
	99-02	-	*48*	72	63	*60*	64
	03-06	-	*69*	*75*	96	*73*	79
Class 2	91-94	-	-	-	-	-	-
	95-98	-	-	-	-	-	*54*
	99-02	-	-	-	-	-	*24*
	03-06	-	-	*115*	-	-	*74*
Class 3	91-94	-	-	-	-	-	-
	95-98	-	-	-	-	-	-
	99-02	-	-	-	-	-	-
	03-06	-	-	-	-	-	-
Class 4	91-94	-	-	-	-	-	-
	95-98	-	-	-	-	-	-
	99-02	-	-	-	-	-	-
	03-06	-	-	-	-	-	-
Class Unknown	91-94	-	-	-	-	-	*110*
	95-98	-	-	-	-	-	-
	99-02	-	-	-	-	-	-
	03-06	-	-	-	-	-	-
All Business	91-94	-	*40*	*69*	*97*	-	70
	95-98	-	*55*	*51*	*40*	-	47
	99-02	-	*38*	62	51	*50*	53
	03-06	-	*50*	86	89	*69*	77

Values based on fewer than 30 actual Claimant Deaths are shown in *italic*;
no results are shown for cells where there are fewer than 10 actual Claimant Deaths.

Figure 4.1:
Comparison of **actual Claimant Recoveries** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **CMI Occupation Class 1**;
1991-2006 by quadrennium, Sex and Deferred Period; all ages and durations Sick combined.

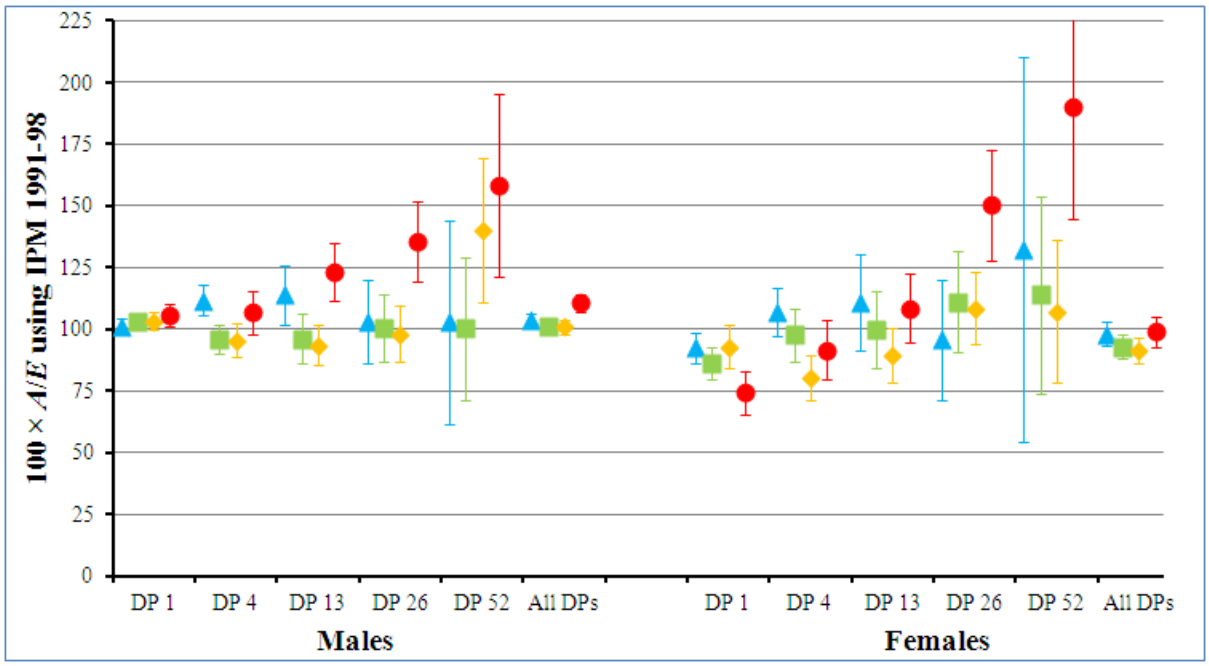
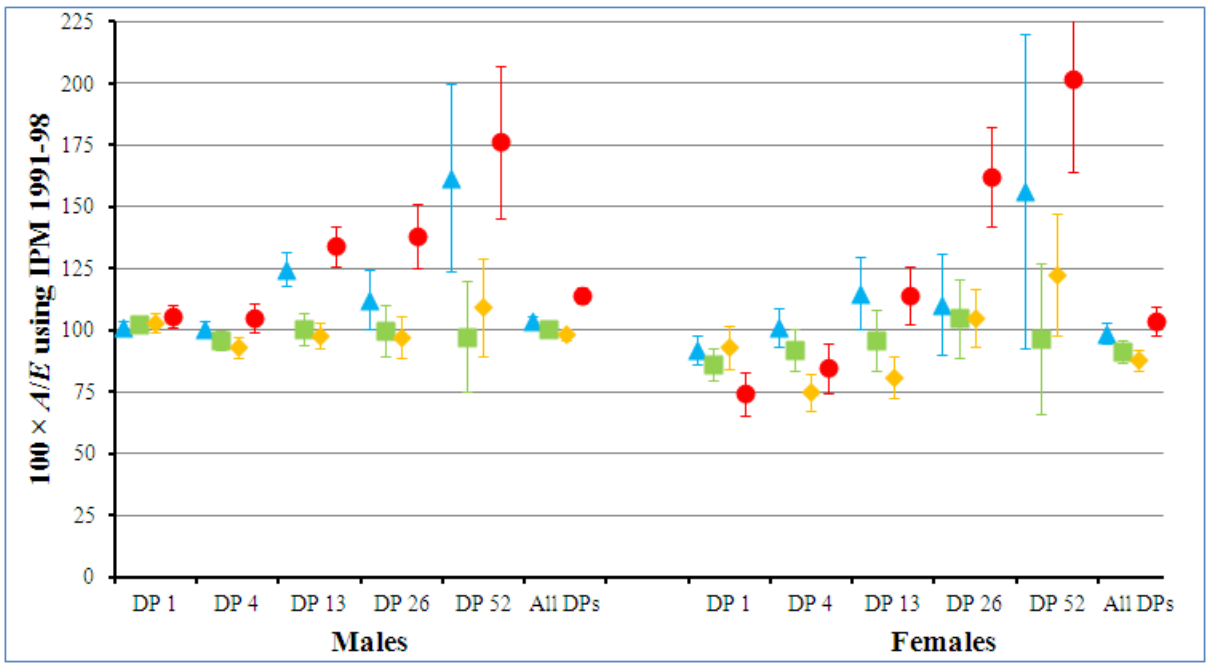


Figure 4.2:
Comparison of **actual Claimant Recoveries** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **All Occupation Classes combined**;
1991-2006 by quadrennium, Sex and Deferred Period; all ages and durations Sick combined.



▲ 1991-94 ■ 1995-98 ◆ 1999-02 ● 2003-06

The error bars show approximate 95% confidence intervals, $100 \times A/E \pm 1.96\sigma$, where $\sigma = 100 \times \sqrt{A}/E$.
Data points based on fewer than 10 actual Claimant Recoveries are omitted from the above Figures.

Figure 4.3:
Comparison of **actual Claimant Recoveries** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 1 week**;
1991-2006 by quadrennium, Sex and Occ Class; all ages and durations Sick combined.

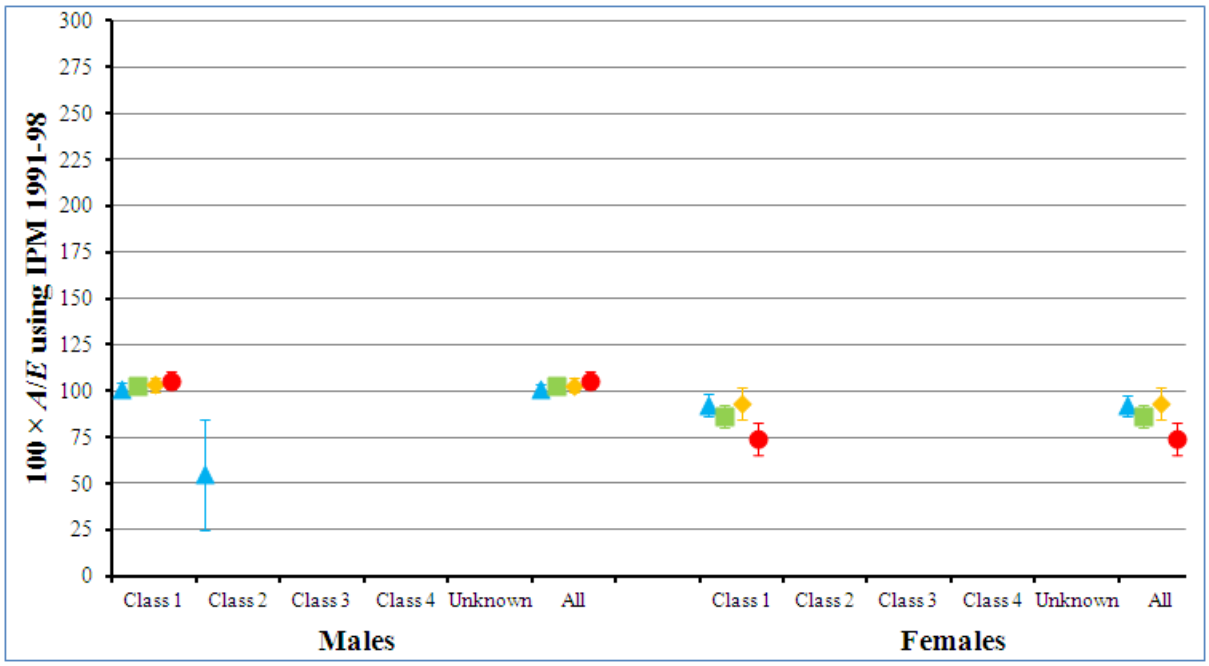
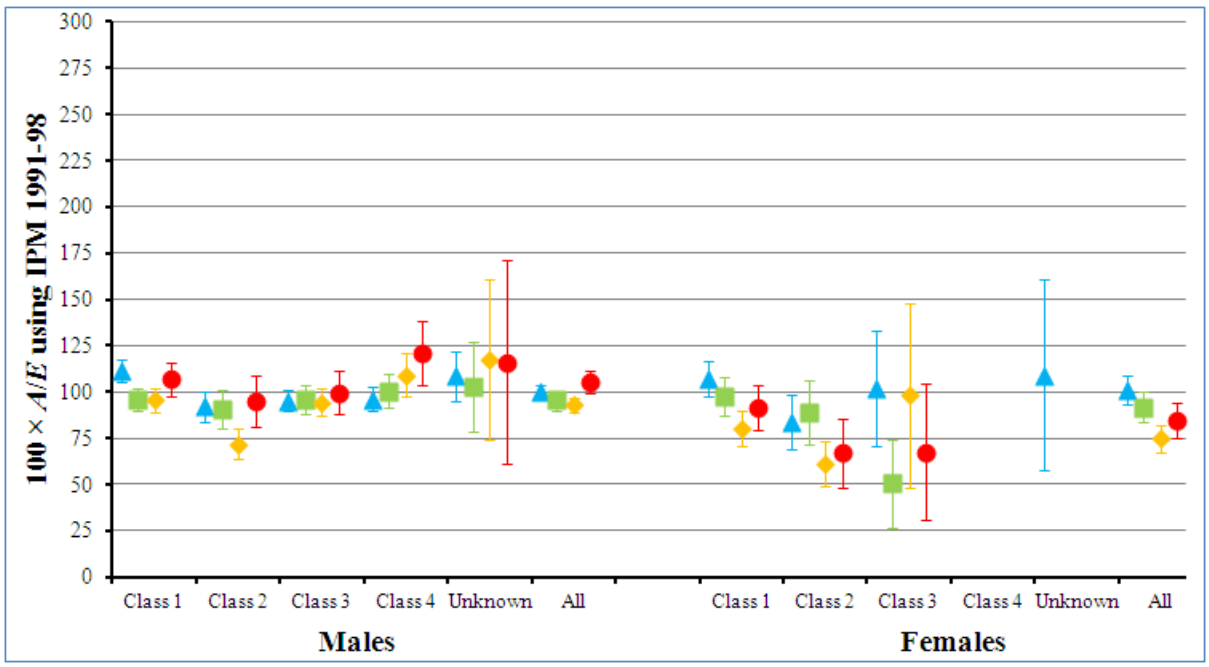


Figure 4.4:
Comparison of **actual Claimant Recoveries** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 4 weeks**;
1991-2006 by quadrennium, Sex and Occ Class; all ages and durations Sick combined.



▲ 1991-94 ■ 1995-98 ◆ 1999-02 ● 2003-06

The error bars show approximate 95% confidence intervals, $100 \times A/E \pm 1.96\sigma$, where $\sigma = 100 \times \sqrt{A}/E$.
Data points based on fewer than 10 actual Claimant Recoveries are omitted from the above Figures.

Figure 4.5:
Comparison of **actual Claimant Recoveries** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 13 weeks**;
1991-2006 by quadrennium, Sex and Occ Class; all ages and durations Sick combined.

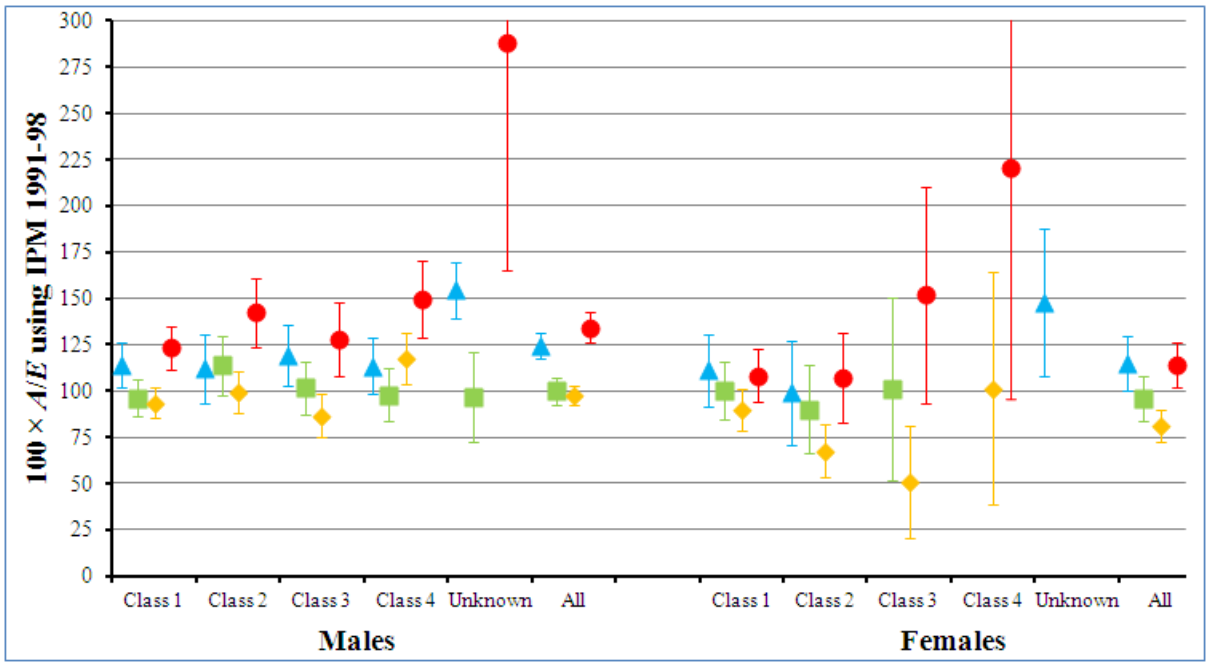
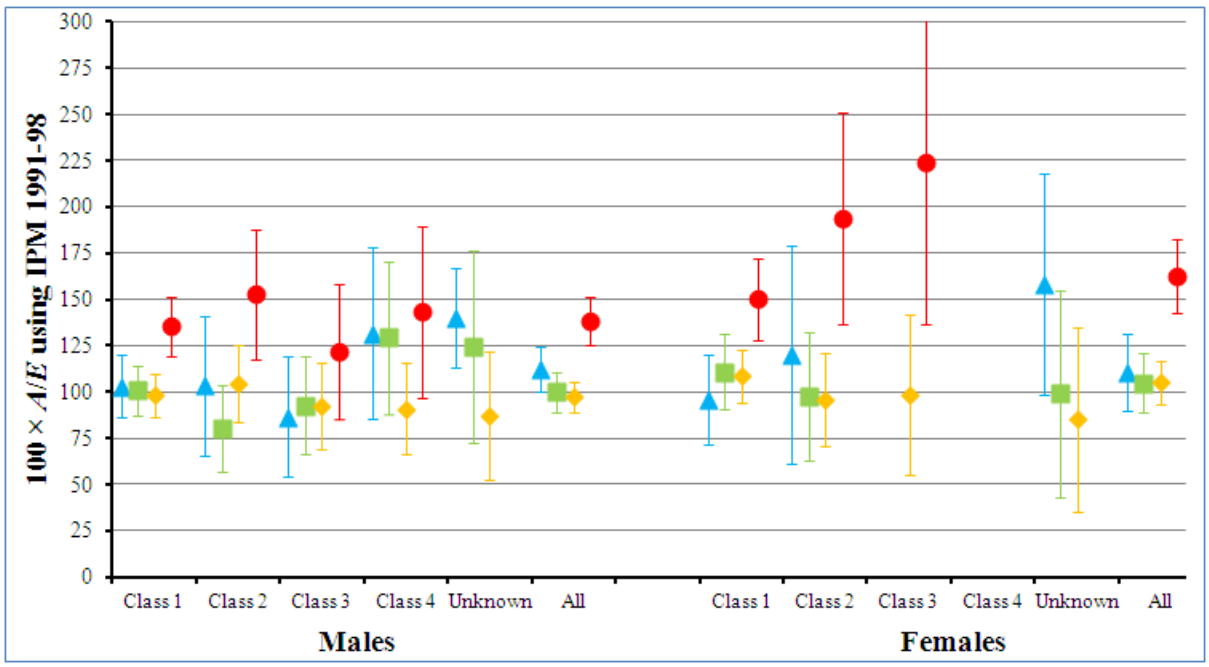


Figure 4.6:
Comparison of **actual Claimant Recoveries** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 26 weeks**;
1991-2006 by quadrennium, Sex and Occ Class; all ages and durations Sick combined.



▲ 1991-94 ■ 1995-98 ◆ 1999-02 ● 2003-06

The error bars show approximate 95% confidence intervals, $100 \times A/E \pm 1.96\sigma$, where $\sigma = 100 \times \sqrt{A}/E$.
Data points based on fewer than 10 actual Claimant Recoveries are omitted from the above Figures.

Figure 4.7:
Comparison of **actual Claimant Recoveries** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 52 weeks**;
1991-2006 by quadrennium, Sex and Occ Class; all ages and durations Sick combined.

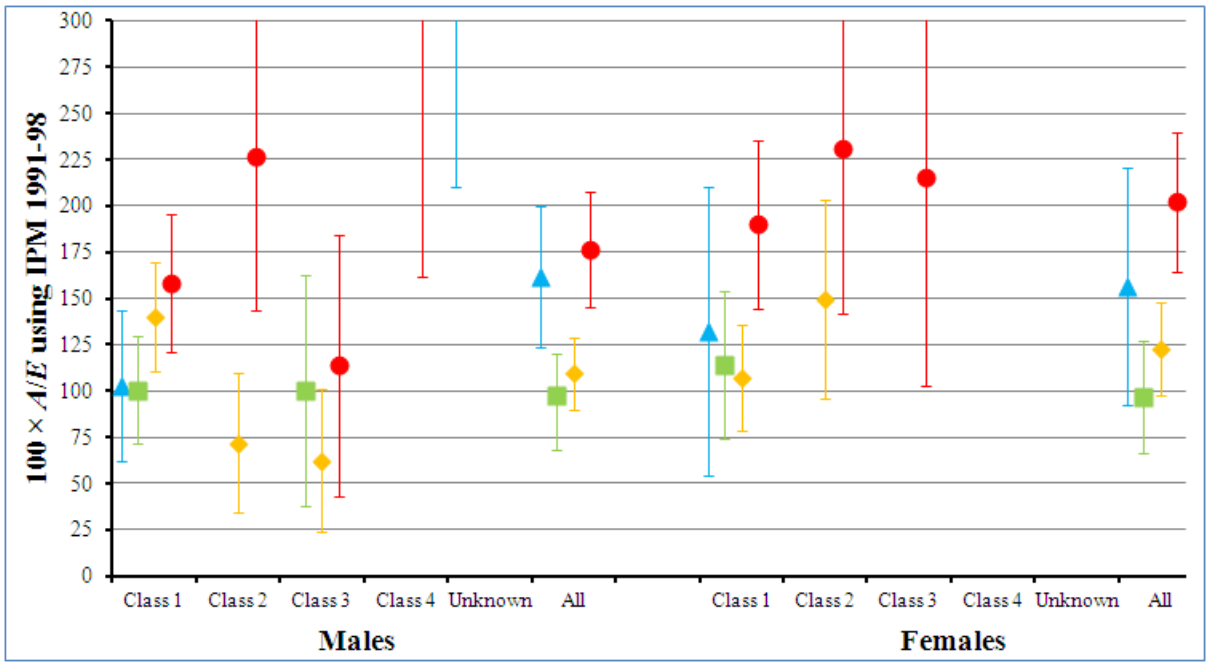
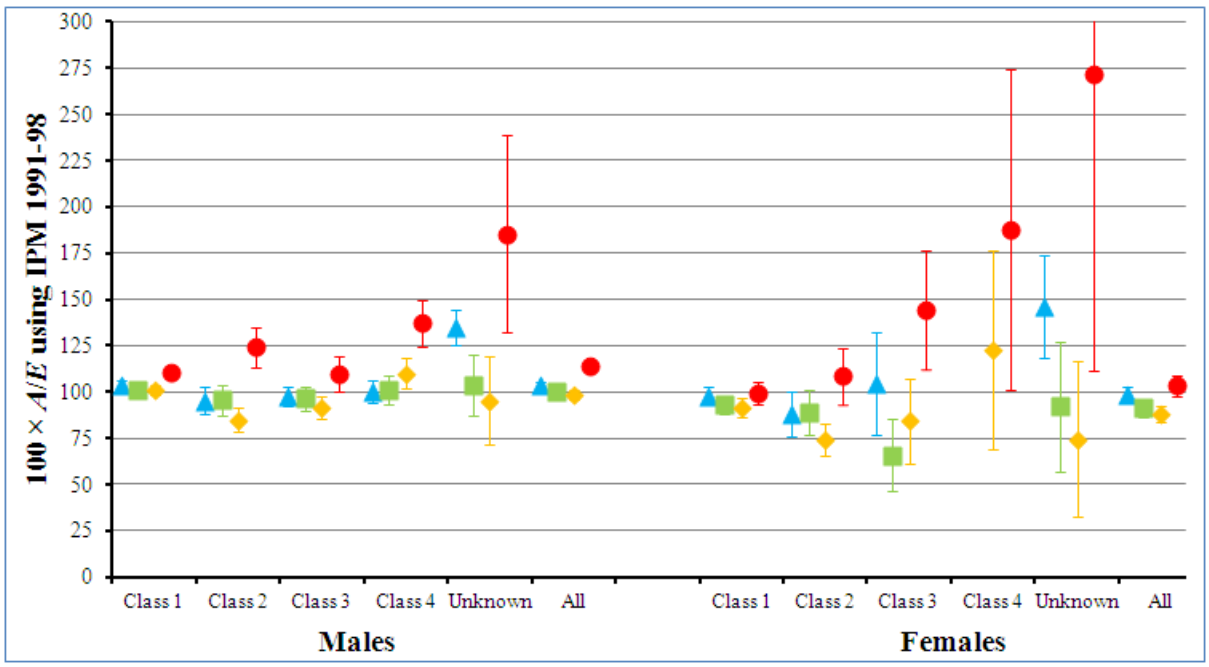


Figure 4.8:
Comparison of **actual Claimant Recoveries** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **All Deferred Periods combined**;
1991-2006 by quadrennium, Sex and Occ Class; all ages and durations Sick combined.



▲ 1991-94 ■ 1995-98 ◆ 1999-02 ● 2003-06

The error bars show approximate 95% confidence intervals, $100 \times A/E \pm 1.96\sigma$, where $\sigma = 100 \times \sqrt{A}/E$.
Data points based on fewer than 10 actual Claimant Recoveries are omitted from the above Figures.

Figure 4.9:
Comparison of **actual Claimant Deaths** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **CMI Occupation Class 1**;
1991-2006 by quadrennium, Sex and Deferred Period; all ages and durations Sick combined.

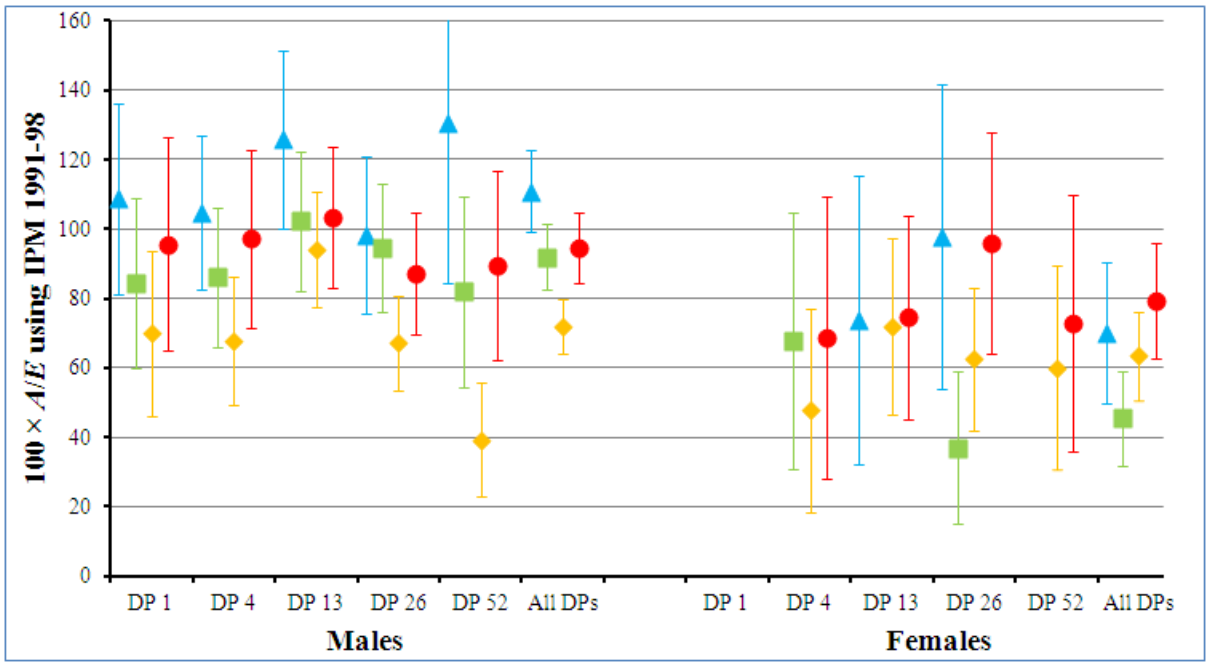
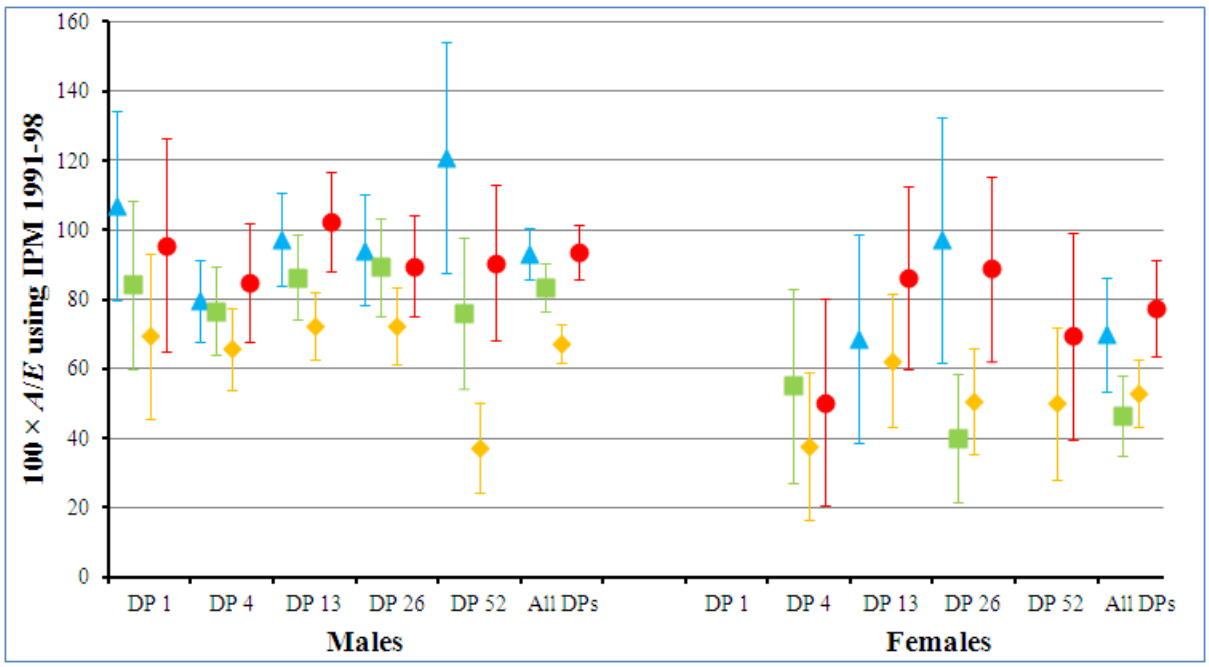


Figure 4.10:
Comparison of **actual Claimant Deaths** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **All Occupation Classes combined**;
1991-2006 by quadrennium, Sex and Deferred Period; all ages and durations Sick combined.



▲ 1991-94 ■ 1995-98 ◆ 1999-02 ● 2003-06

The error bars show approximate 95% confidence intervals, $100 \times A/E \pm 1.96\sigma$, where $\sigma = 100 \times \sqrt{A}/E$.
Data points based on fewer than 10 actual Claimant Deaths are omitted from the above Figures.

Figure 4.11:
Comparison of **actual Claimant Deaths** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 1 week**;
1991-2006 by quadrennium, Sex and Occ Class; all ages and durations Sick combined.

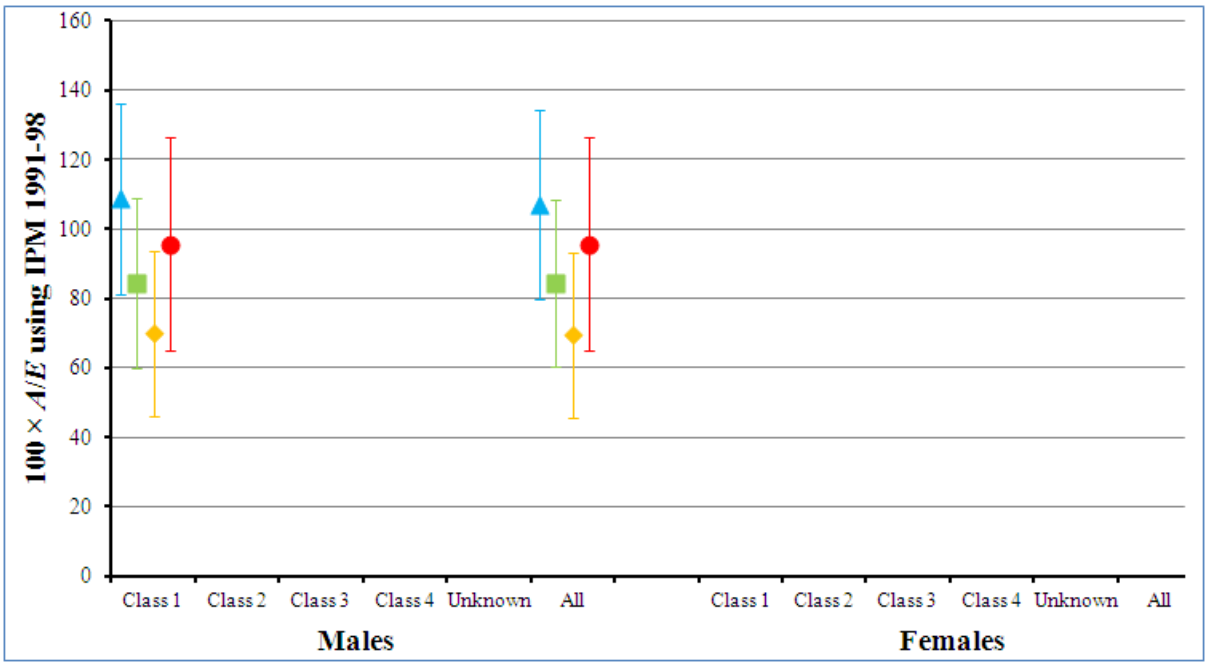
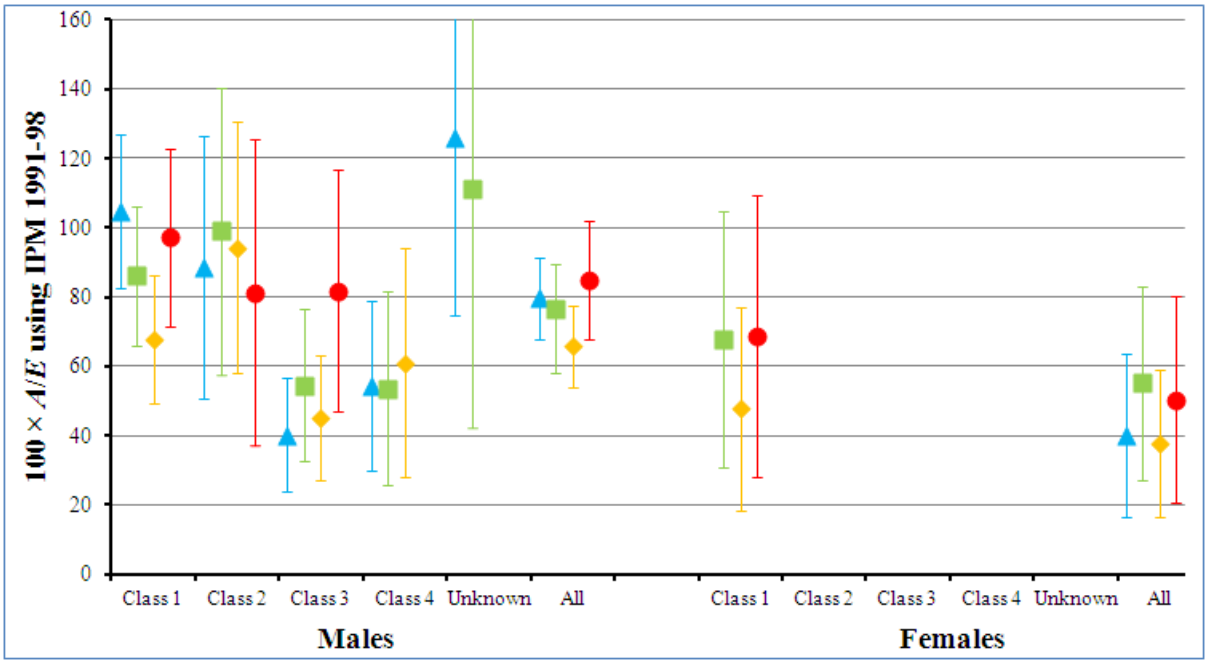


Figure 4.12:
Comparison of **actual Claimant Deaths** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 4 weeks**;
1991-2006 by quadrennium, Sex and Occ Class; all ages and durations Sick combined.



▲ 1991-94 ■ 1995-98 ◆ 1999-02 ● 2003-06

The error bars show approximate 95% confidence intervals, $100 \times A/E \pm 1.96\sigma$, where $\sigma = 100 \times \sqrt{A}/E$.
Data points based on fewer than 10 actual Claimant Deaths are omitted from the above Figures.

Figure 4.13:
Comparison of **actual Claimant Deaths** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 13 weeks**;
1991-2006 by quadrennium, Sex and Occ Class; all ages and durations Sick combined.

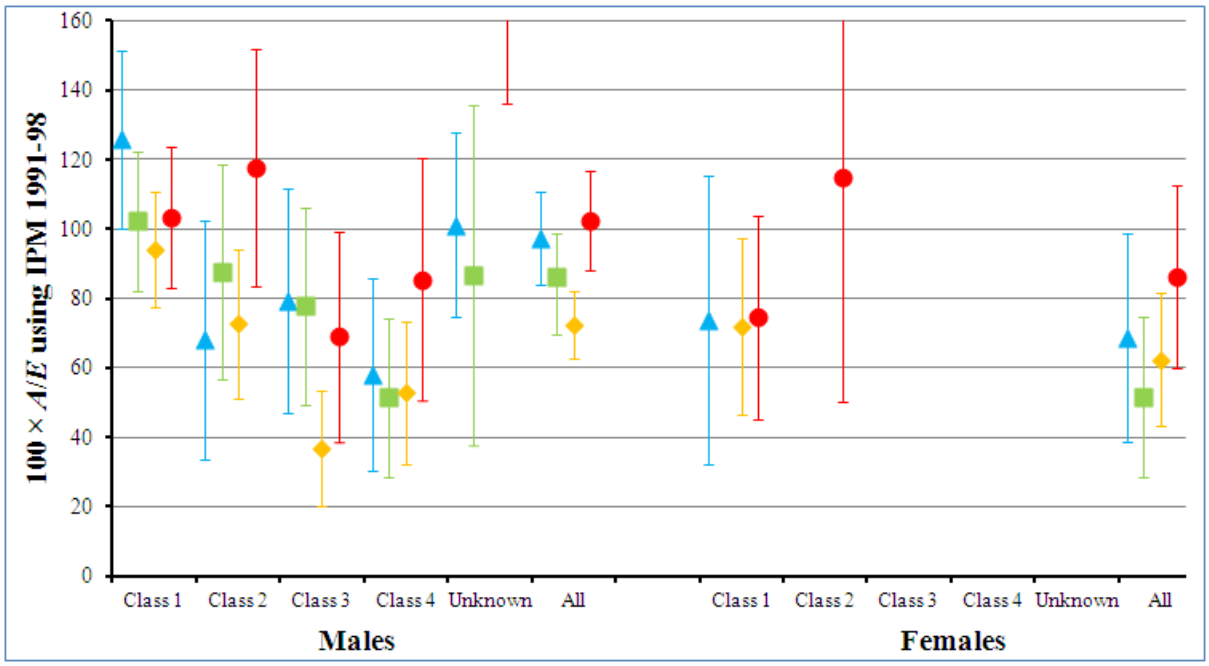
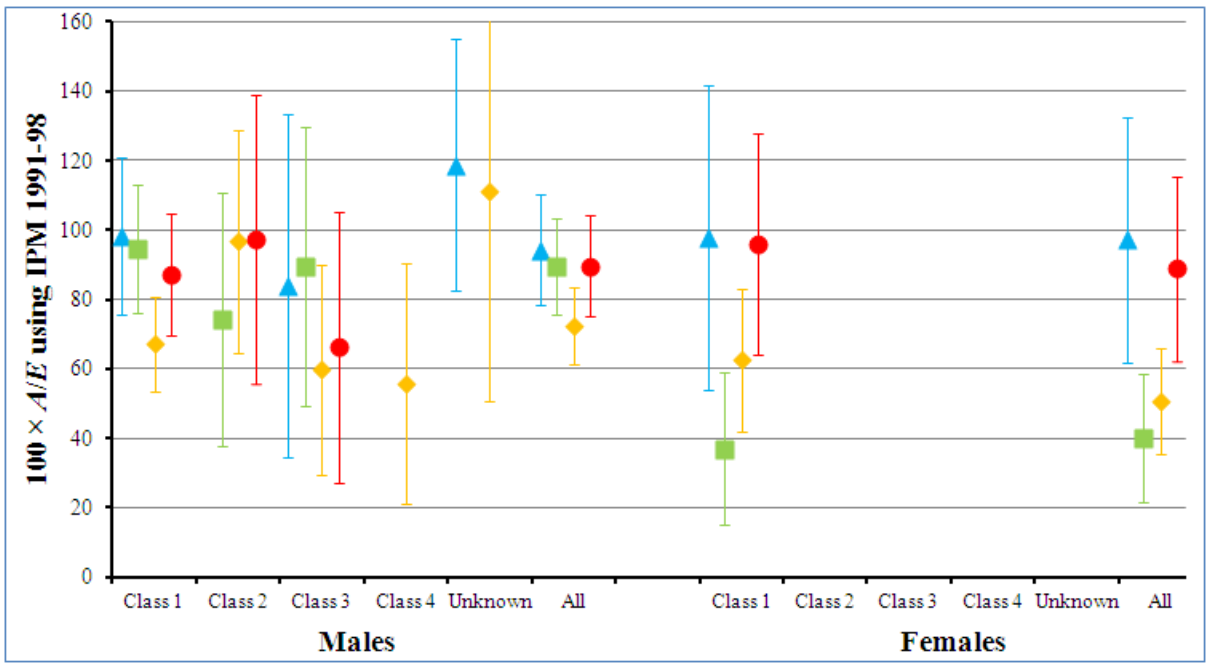


Figure 4.14:
Comparison of **actual Claimant Deaths** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 26 weeks**;
1991-2006 by quadrennium, Sex and Occ Class; all ages and durations Sick combined.



▲ 1991-94 ■ 1995-98 ◆ 1999-02 ● 2003-06

The error bars show approximate 95% confidence intervals, $100 \times A/E \pm 1.96\sigma$, where $\sigma = 100 \times \sqrt{A}/E$.
Data points based on fewer than 10 actual Claimant Deaths are omitted from the above Figures.

Figure 4.15:
Comparison of **actual Claimant Deaths** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **Deferred Period 52 weeks**;
1991-2006 by quadrennium, Sex and Occ Class; all ages and durations Sick combined.

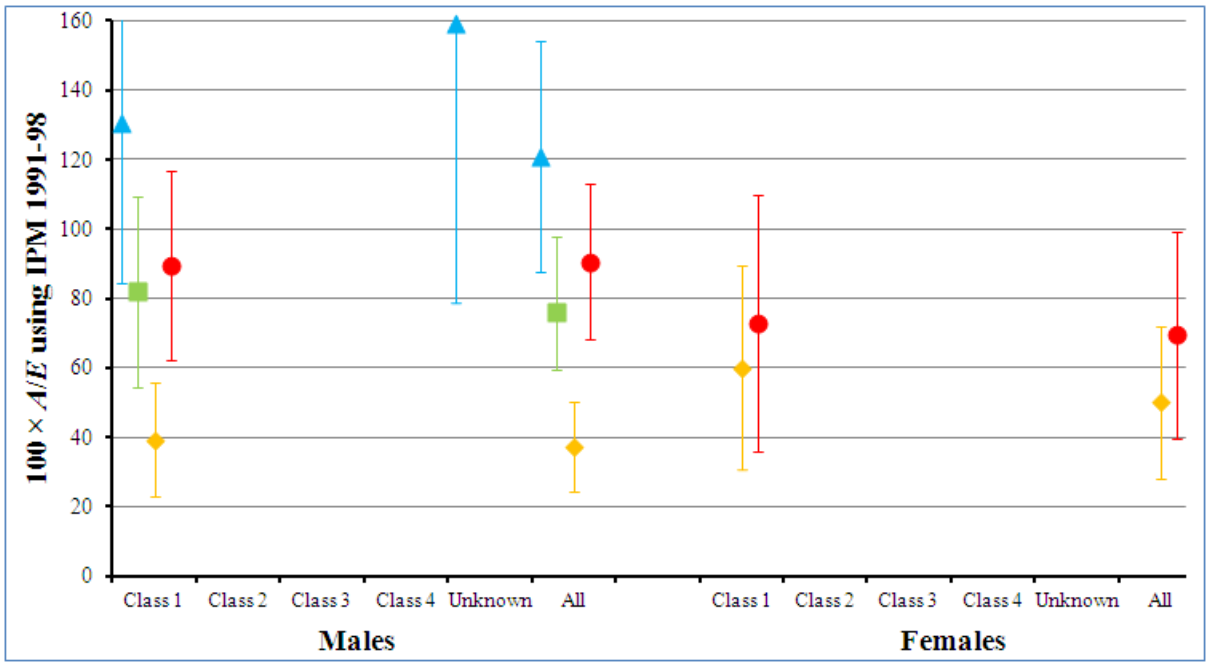
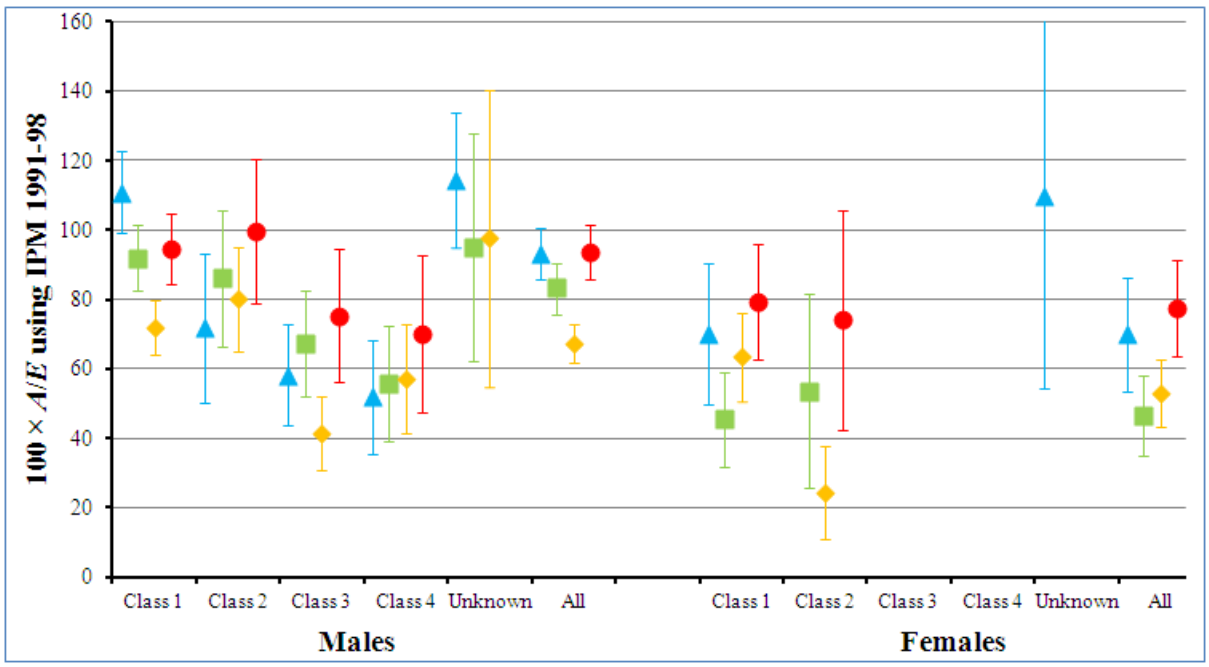


Figure 4.16:
Comparison of **actual Claimant Deaths** with those **expected using IPM 1991-98;**
Individual Income Protection *Standard** experience for **All Deferred Periods combined**;
1991-2006 by quadrennium, Sex and Occ Class; all ages and durations Sick combined.



▲ 1991-94 ■ 1995-98 ◆ 1999-02 ● 2003-06

The error bars show approximate 95% confidence intervals, $100 \times A/E \pm 1.96\sigma$, where $\sigma = 100 \times \sqrt{A}/E$.
Data points based on fewer than 10 actual Claimant Deaths are omitted from the above Figures.

5. CONTRIBUTING OFFICES

The Executive Committee and the IP Committee wish to thank the following offices which have contributed data for the 2003-06 quadrennium to this Investigation.

Aviva
AXA
Friends Provident
Guardian Financial Services
Legal & General
LV=
Pearl Group
Royal Bank of Scotland
Scottish Widows
Standard Life
UNUM
Wesleyan
Zurich Financial Services

REFERENCES

CMIR 12 (1991)
The Analysis of Permanent Health Insurance Data

CMIR 18 (2000)
Sickness Experience 1991-1994 for Individual Income Protection Policies

CMIR 20 (2001)
Sickness Experience 1995-1998 for Individual Income Protection Policies

CMIR 22 (2005)
Sickness Experience 1999-2002 for Individual Income Protection Policies

CMI Working Paper 48 (2010)
An overview of the Graduations of Sickness Inception and Termination Rates for the CMI Individual Income Protection Experience for 1991-98 of Males, Occupation Class 1

CMI Working Paper 59 (2012)
Reporting Sickness Experience for the CMI Individual Income Protection Investigation: Summary statement of revised methodology; Description of updated format of results tables; and Analysis of change in methodology and comparison basis

CMI IP Investigation Coding Guide v3.0 (2009)

Additional CMI Reports and Working Papers are noted in the Appendix.

All these CMI papers may be accessed via the CMI pages on the UK Actuarial Profession's website: http://www.actuaries.org.uk/research-and-resources/pages/continuous-mortality-investigation-working-papers.

Board for Actuarial Standards: Technical Actuarial Standard D: Data (November 2009)

Board for Actuarial Standards: Technical Actuarial Standard M: Modelling (April 2010)

These documents may be accessed at: http://www.frc.org.uk/bas/standards/tas.cfm)

APPENDIX: A SUMMARY OF CMI PAPERS ON IP EXPERIENCE

This appendix lists the CMI Reports and Working Papers charting the development of the Individual IP Investigation and experience.

The first Report, published in CMIR 2 (1976) described the experience of 1972 and 1973 and compared actual weeks of Sickness with those expected on the basis of the Manchester Unity A.H.J. table. Claim Inception rates for quinquennial age groups were also tabulated. The Report also described the data coding system and computer processes.

The second Report, CMIR 4 (1979) described the experience of 1972-75 and a graduated Manchester Unity-type table and Claim Inception rate table based on that experience.

The third Report, CMIR 7 (1984) described the experience of 1975-78 and a graduated Manchester Unity-type table and Claim Inception rate table based on that experience. It also introduced the concept of *Standard* data which is an elite subset of the overall *Aggregate* data.

The fourth Report, published in CMIR 11 (1991) described the experience of 1979-82 using the 1975-78 graduated rates as the comparison basis.

The above Reports all relied on the traditional Manchester Unity approach to analysing IP data. Most practical IP pricing has for many years been based around an Inception/disability annuity approach. Although some analysis of Claim Inception rates had been carried out in these Reports, they contained no analysis of Claim Termination rates. CMIR 12 introduced a multiple state model for IP which reconciled the two approaches. The individual male *Standard* data for 1975-78 were used to develop graduated transition intensities between Healthy and Sick, Sick and Healthy and Sick and Dead.

Two subsequent Reports published in CMIR 15 (1996), covering Claim Inceptions and Terminations experience respectively, used the model to compare the experience of 1975-1990 by quadrennium with the graduated rates based on individual *Standard* data for 1975-78. The reports also described the revised methodology and reporting format used for that and subsequent analyses.

With effect from the 1991 Investigation Year, the CMI started to collect IP data sub-divided by Occupation Class.

The first Report analysing experience by CMI Occupation Class, in CMIR 18 (2000), reported on the experience of individual IP business in 1991-94. It described the *Standard* experience of that quadrennium, which is not sub-divided by Occupation Class, to enable comparison with previous quadrennia. It also introduced a new subset of the data, the *Standard** data, which broke the experience down into four broad Occupation Classes and a fifth Class for data where the true Occupation Class was unknown.

Two Papers by Korabinski and Waters, also included in CMIR 18, presented an analysis of the IP experience of individual companies, using both a Generalised Linear Model and a credibility model to explore the features of the 1987-94 individual IP data. These Papers provided more information on variation in experience between offices than had previously been published.

The next two quadrennium Reports, in CMIR 20 (2001) and CMIR 22 (2005), covered the experience of individual IP business, by CMI Occupation Class, in 1995-98 and 1999-2002 respectively. These were in a similar format to the CMIR 18 Report but showed the development of experience since 1991-94 and also gave a limited amount of additional information on the variation of experience by office on an anonymous basis. These two Reports also reported the experience of a subset of 'loyal' offices which were present over an extended period – such an analysis reduces (but cannot entirely remove) the potentially distorting effects of changes in the mix of offices over time.

CMI Working Paper 23 (2006) presented some data and analysis on individual IP experience by cause of disability largely based on data for 1991-2002. This was the result of a one-off project adding some depth to the main Investigation.

Work to produce a new set of graduations, by applying the CMIR 12 multiple-state Sickness model to the experience of males, Occupation Class 1, for 1991-98, resulted in a considerable body of work reported through a series of CMI Working Papers. Working Papers 5, 6 and 7 (2004) covered the development of Sickness Termination rates (and a number of data issues addressed along the way); Working Papers 46 and 47 (2010) covered the development of Sickness and Claim Inception rates (and additional data and methodology issues); and Working Paper 48 (2010) provides an overview of the graduations work as a whole.

A large number of refinements were introduced to the methodology as part of the development work for these new graduations. The corresponding changes have now been implemented in the CMI's IP experience analysis tools. In addition the format of results has also been revised and ease of access has been improved by releasing them in Microsoft Office Excel workbooks.

This Paper (CMI Working Paper 60) brings the new graduations (and methodology and reporting improvements) fully into use by providing a re-statement of the results for 1991-2006, by quadrennium, using IPM 1991-98 as the comparison basis. The focus of the Paper is a report on the experience of the quadrennium 2003-06, but it also provides a high-level analysis of the trends in experience over 1991-2006.

CMI Working Paper 59 (2012) acts as a technical reference document for this Paper and for subsequent reports using the updated methodology and reporting format. It provides a summary statement of the revised methodology, a description of the updated format of results tables, a practitioners' guide to the statistical tests reported with the results, and a high-level analysis of the change in reported results, for 1991-2006, arising from the methodology improvements and the change in comparison basis.