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A3: Critical Illness claims experience

James Tait and Jamie Leitch
CMI Critical Illness Committee

Workshop A3
Health and Care Conference 2013
Celtic Manor, Newport

15 May 2013

CMI Critical Illness claims experience

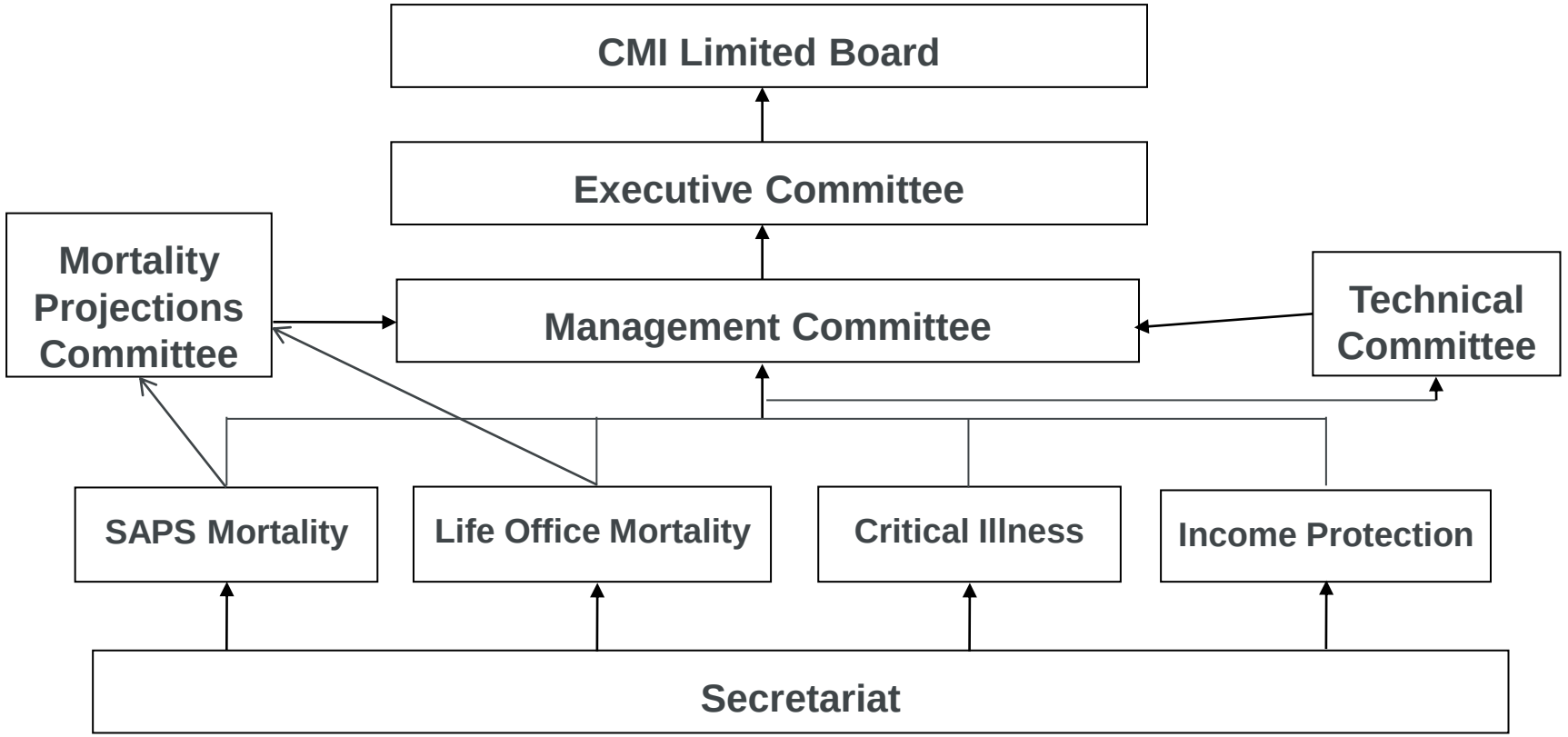
Agenda

- Background
  - Changes to the CMI
  - Overview of CMI critical illness committee past work
- 2003-2006 results
  - AC04 Diagnosis rates
  - 2003-2006 results & analysis
- Changes to CMI analysis methodology
  - Summary of changes
  - Impact on 2003-2006 results
- 2007-2011 data & future work

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CMI Limited - Key changes for users

New UK private company owned by the Institute and Faculty of Actuaries.



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CMI Limited - Key changes for users

Subscriptions

- Structure modified for existing contributors:
  - Life insurers now based on reserves on annuities in payment + capital at risk
  - Reinsurers now flat fee (£20,000 p.a.)
  - Consultancies - small increase in fees for 2013/14 plus new “per actuary” fee introduced for very small firms - £250 per qualified actuary per year

Registration system

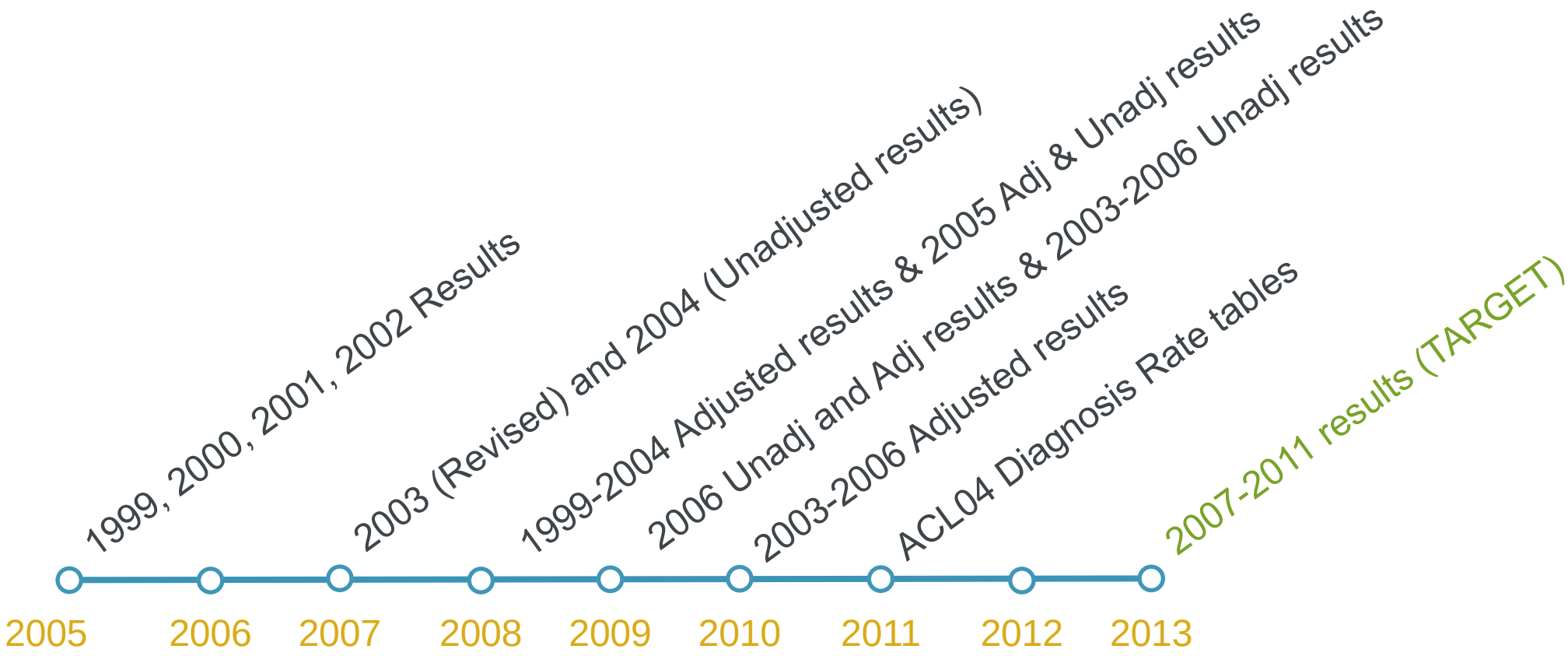
- Full outputs – e.g. working papers – accessible only to registered users
- All actuaries at existing firms will be pre-registered (normal log-in details for the IFoA website)
- Use subject to Terms & Conditions

Any questions please e-mail info@cmib.org.uk

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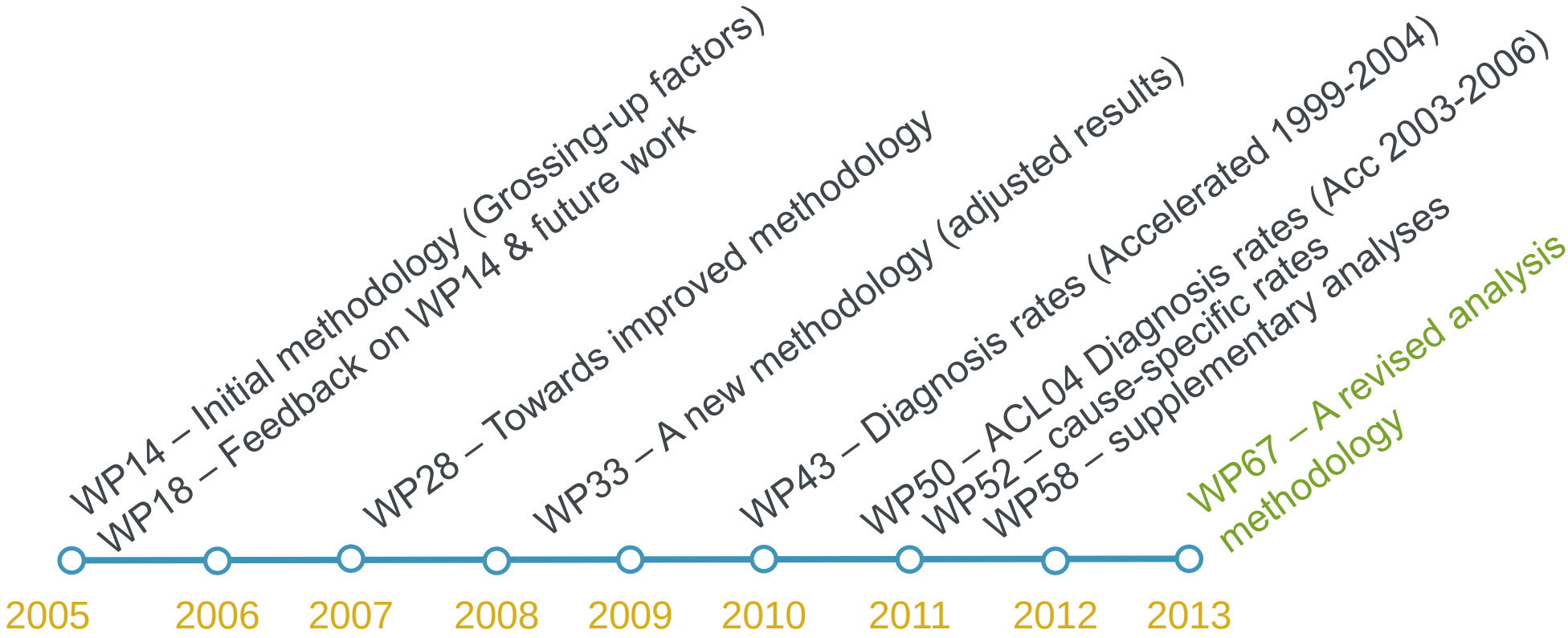
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CMI Critical Illness - Result outputs



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CMI Critical Illness - Analysis outputs



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AC04 rates & 2003-2006 analysis

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onsorship
Thought leadership
Progress
Community
Sessional Meetings
Education
Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
Journals
Suppor

21 May 2013

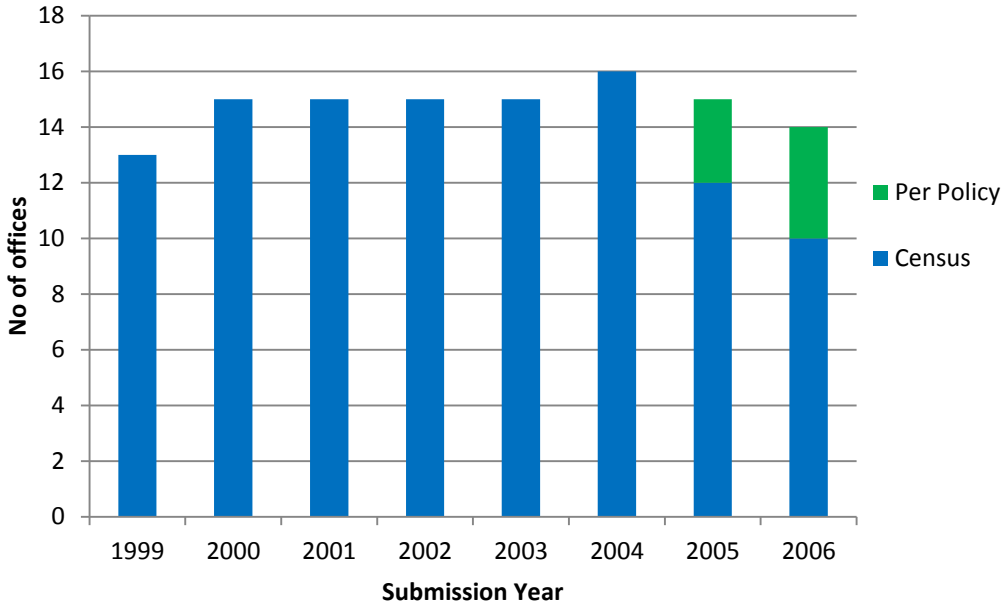
CMI Critical Illness - Scope of AC04 rates

- All-causes accelerated critical illness; Lives table only
- Based on claims settled in 2003-2006
- Four tables for each gender/smoker status
- Durations 0,1,2,3,4 and 5+ for ages 18 to 65; ultimate only for ages 66+:
  - Different selection patterns by gender/smoker status derived from data
  - Rates have been extended outside the age range where there is credible volumes of data
- Age exact basis
- No stand-alone tables

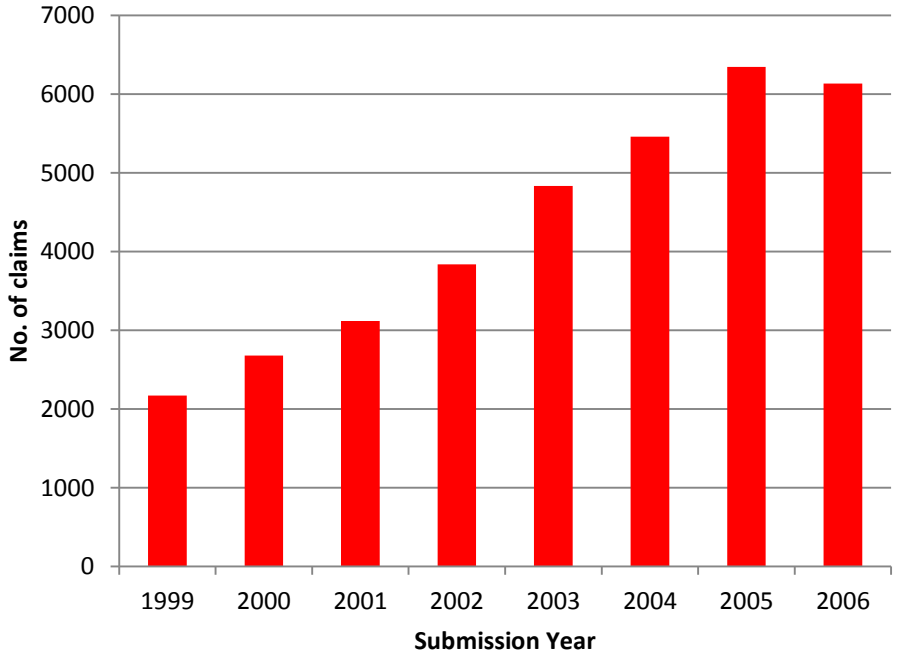
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CMI Critical Illness – AC04 data (03-06)

Census vs Per Policy data submissions, by year



Number of Claims, by submission year



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2003-2006 All-causes Diagnosis Rates (AC04 rates)

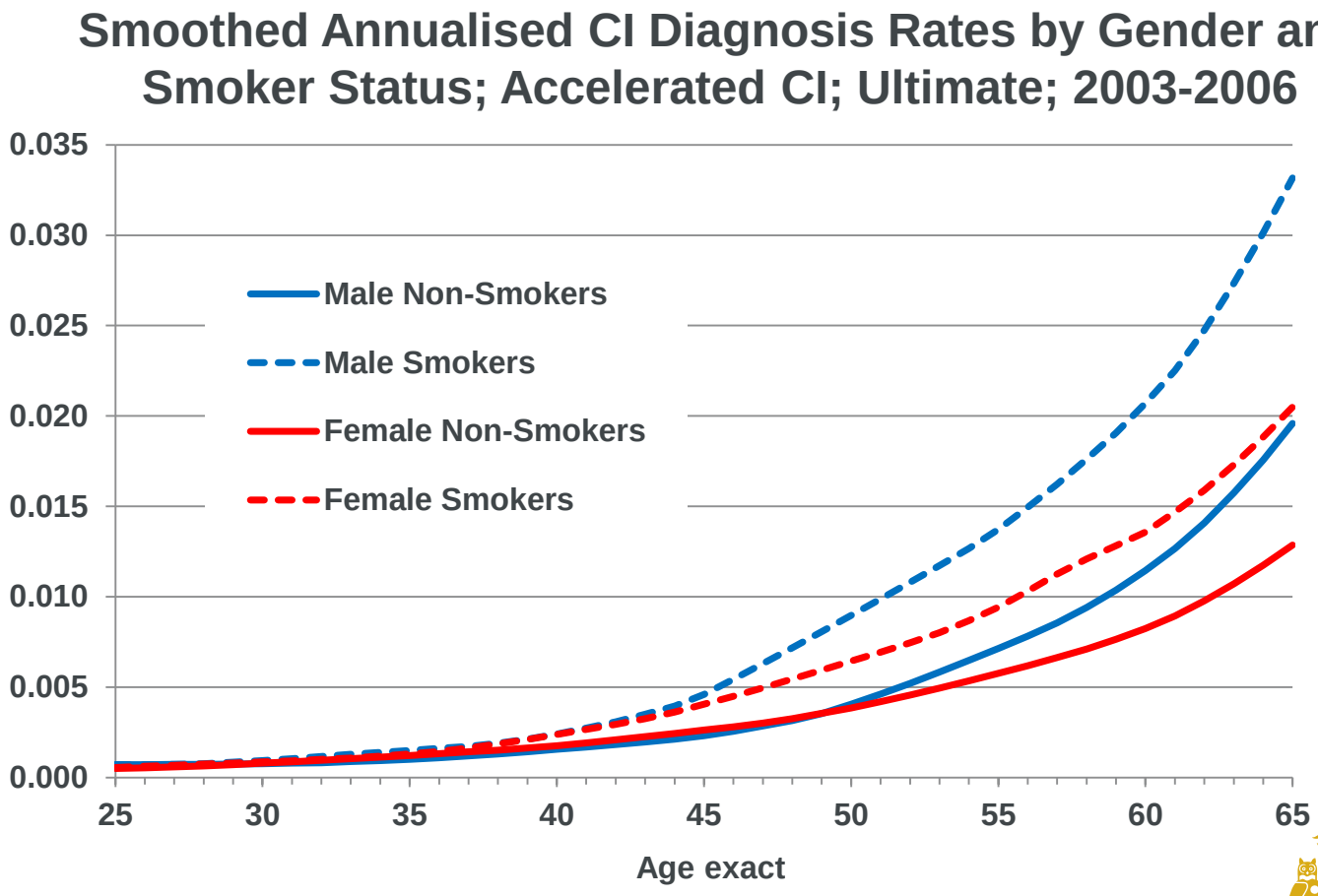


Figure 8.2 from Working Paper 50

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2003-2006 All-causes Diagnosis Rates (AC04 rates)

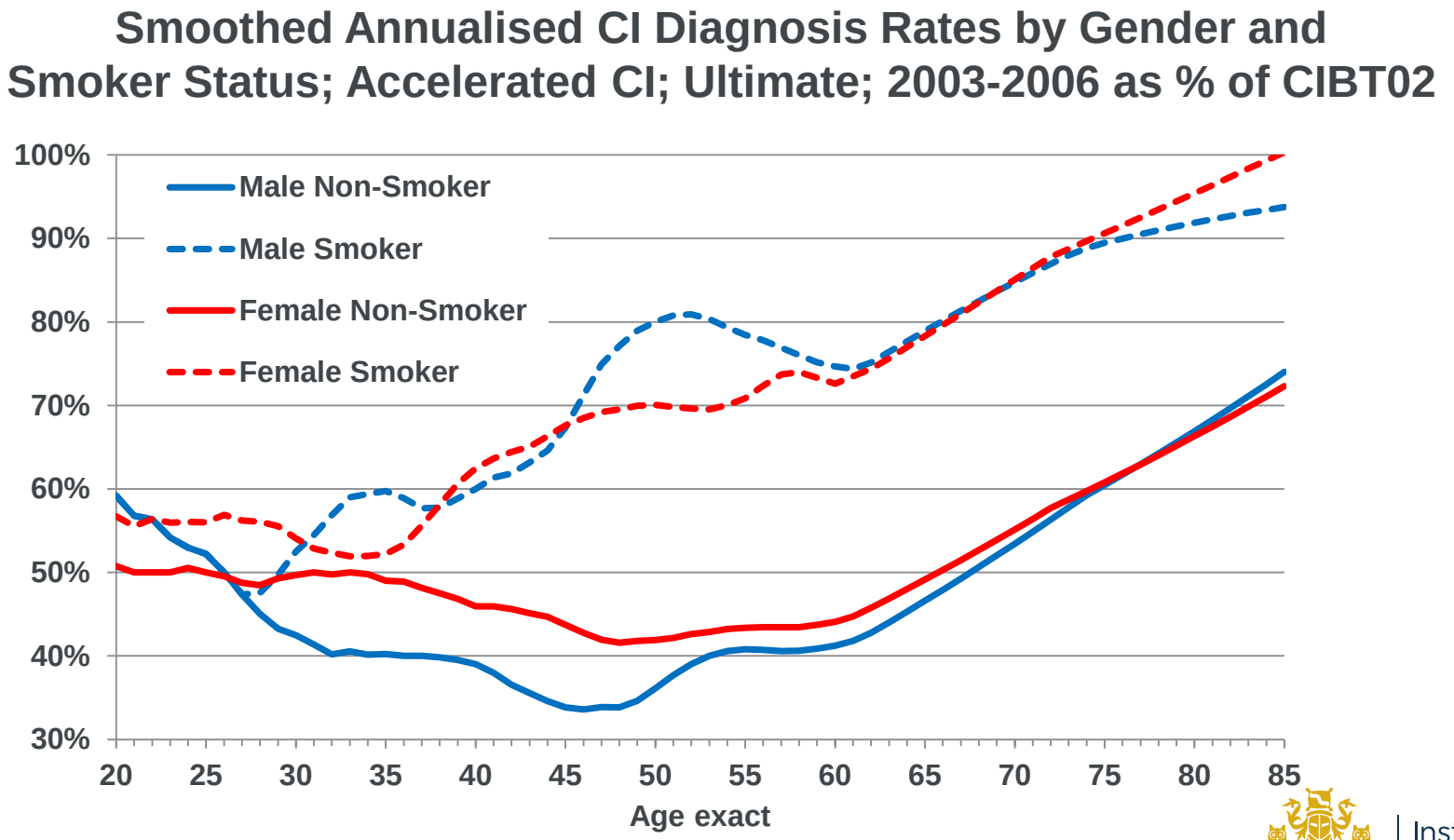


Figure 8.5 from Working Paper 50

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2003-2006 All-causes Diagnosis Rates (AC04 rates)

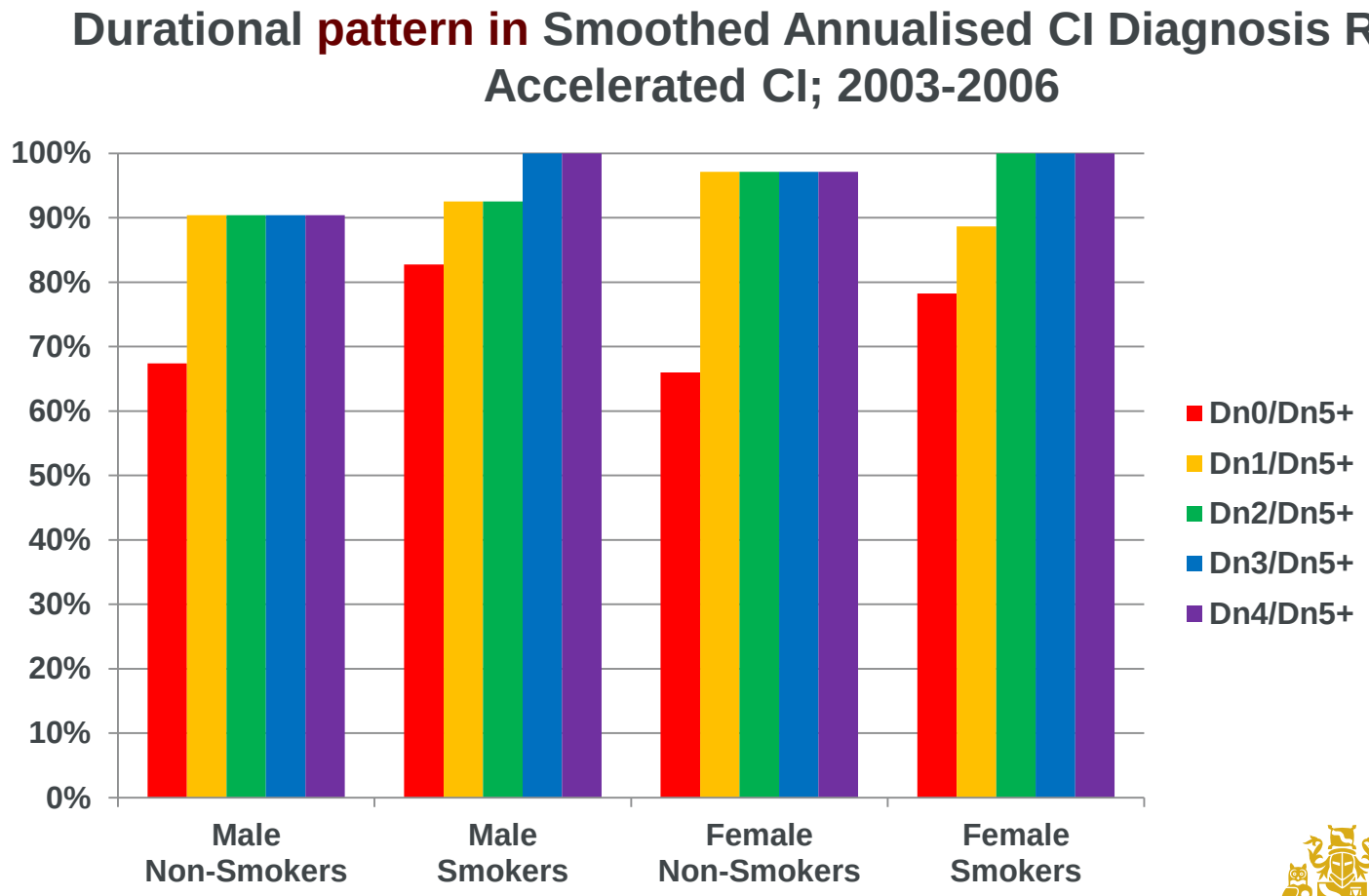
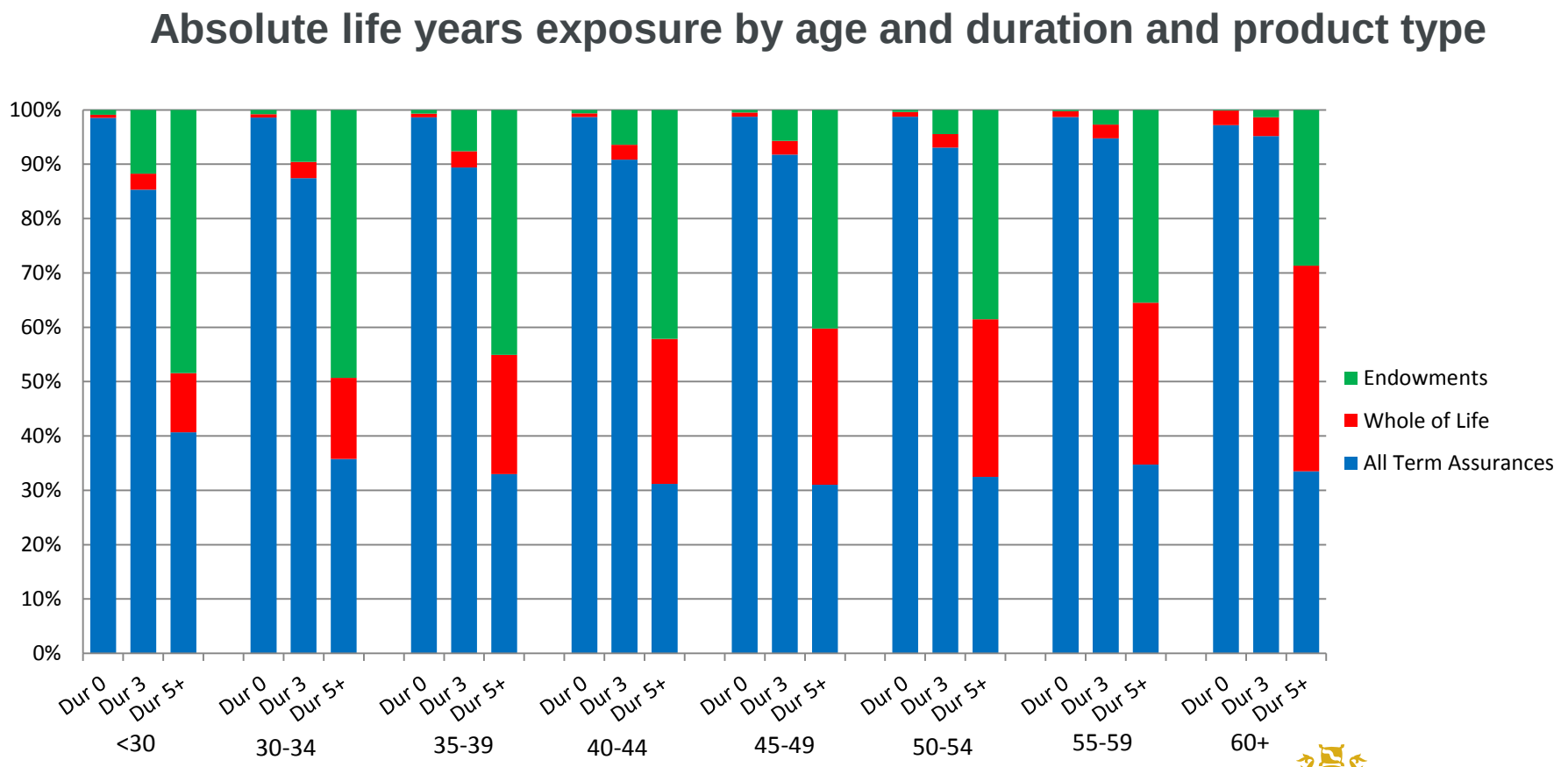


Figure 8.4 from Working Paper 50

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Supplementary Analysis – By product type



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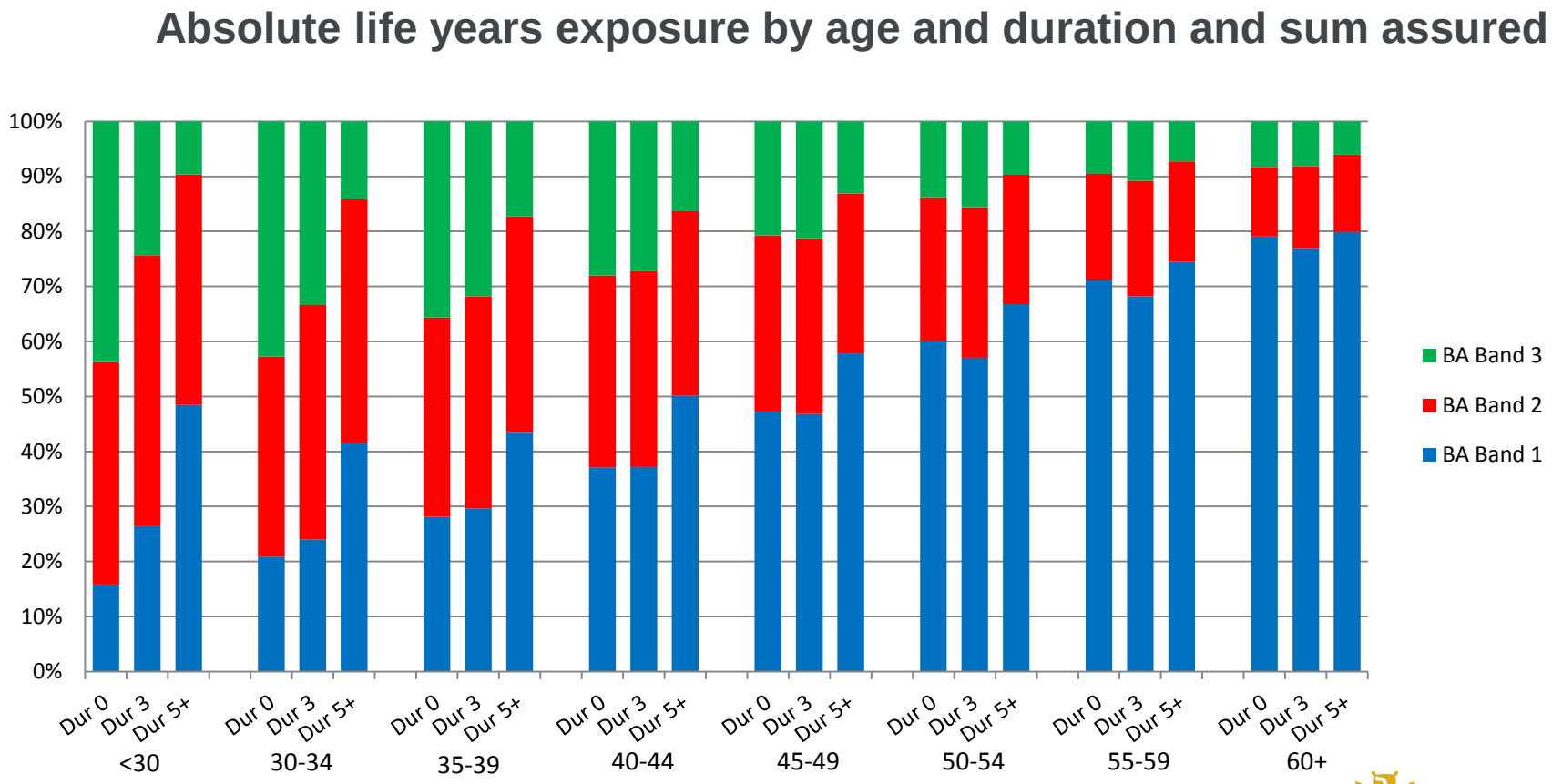
Supplementary Analysis – By product type

Product Type	MNS	MS	FNS	FS	ALL
Decreasing TA	*101%*	*106%*	*102%*	*104%*	*103%*
Level TA	*105%*	*95%*	*103%*	*107%*	*103%*
Unclassified TA	*86%*	*93%*	*93%*	*87%*	*90%*
All Term Assurances	98%	101%	100%	101%	99%
Endowment	101%	96%	92%	100%	97%
Whole of Life	111%	115%	115%	99%	112%

- Approximately 25% of term assurance remains unclassified

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Supplementary Analysis – By sum assured



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Supplementary Analysis – By sum assured

Sum Assured Band	MNS	MS	FNS	FS	ALL
£0 - £40,000	96%	98%	95%	99%	96%
£40,001 - £80,000	105%	105%	103%	101%	104%
£80,001+	101%	104%	103%	104%	102%

- Smallest sums assured have the lightest experience in all cases
- Middle sum assured band has the heaviest experience for males
- Largest band has the heaviest experience for females

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Supplementary Analysis – By sum assured

- Significant increase in claim amounts with time

Comm Year	≤1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Average Sum Assured	£43,813	£46,876	£49,171	£52,163	£61,186	£68,375	£66,711	£67,489	£72,162	£79,740

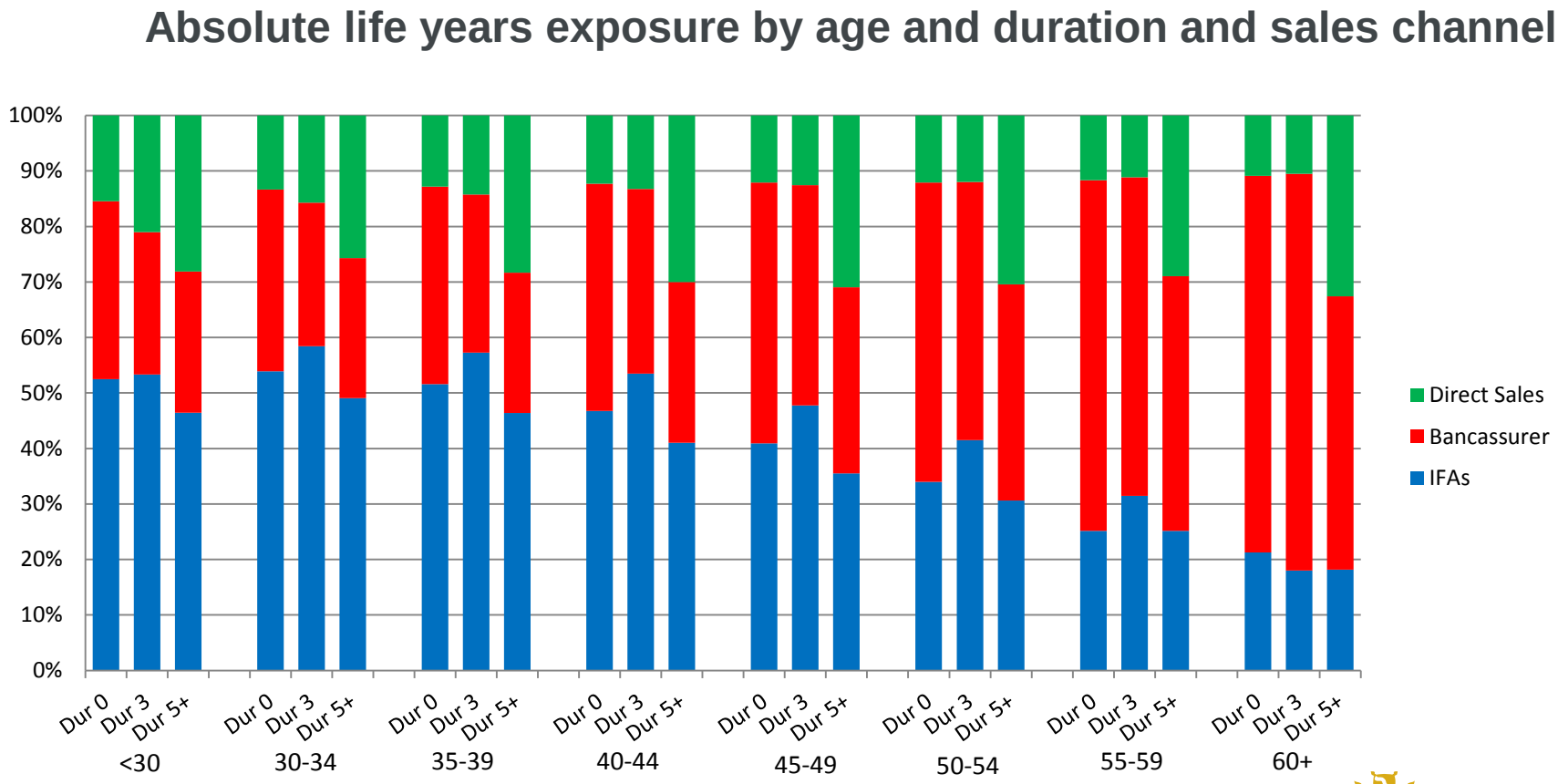
- Change in mix of business sold will also result in change in sum assured

Average claim sum assured by product type

	Average sum assured
Decreasing TA	56,453
Level TA	66,436
Unclassified TA	69,170
All Term Assurances	61,915
Endowment	38,163
Whole of life	60,062

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Supplementary Analysis – By sales channel



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Supplementary Analysis – By sales channel

Sales Channel	MNS	MS	FNS	FS	ALL
Bancassurer	101%	106%	104%	111%	104%
Direct Sales	107%	107%	99%	105%	104%
IFA	99%	97%	98%	90%	97%

- Experience is lightest for IFA sourced business
- For males, experience is heaviest for direct sales
- For females, experience is heaviest for bancassurer

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Supplementary Analysis – By office

Office	MNS	MS	FNS	FS	ALL	All (using central CDD)
A	112%	109%	102%	114%	108%	(108)%
B	94%	96%	94%	92%	94%	94%
C	93%	91%	95%	89%	93%	94%
D	93%	104%	96%	87%	96%	94%
E	101%	93%	101%	93%	99%	99%
F	102%	115%	111%	115%	109%	(109)%
G	95%	92%	101%	78%	95%	95%
H	114%	111%	113%	125%	114%	113%

- Analysis undertaken by Secretariat so not seen by Committee
- Maturity of different offices varies

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Supplementary Analysis - Imputed stand-alone rates

Number of actual settled claims in 2003-2006 by gender and smoker status for stand-alone and accelerated business

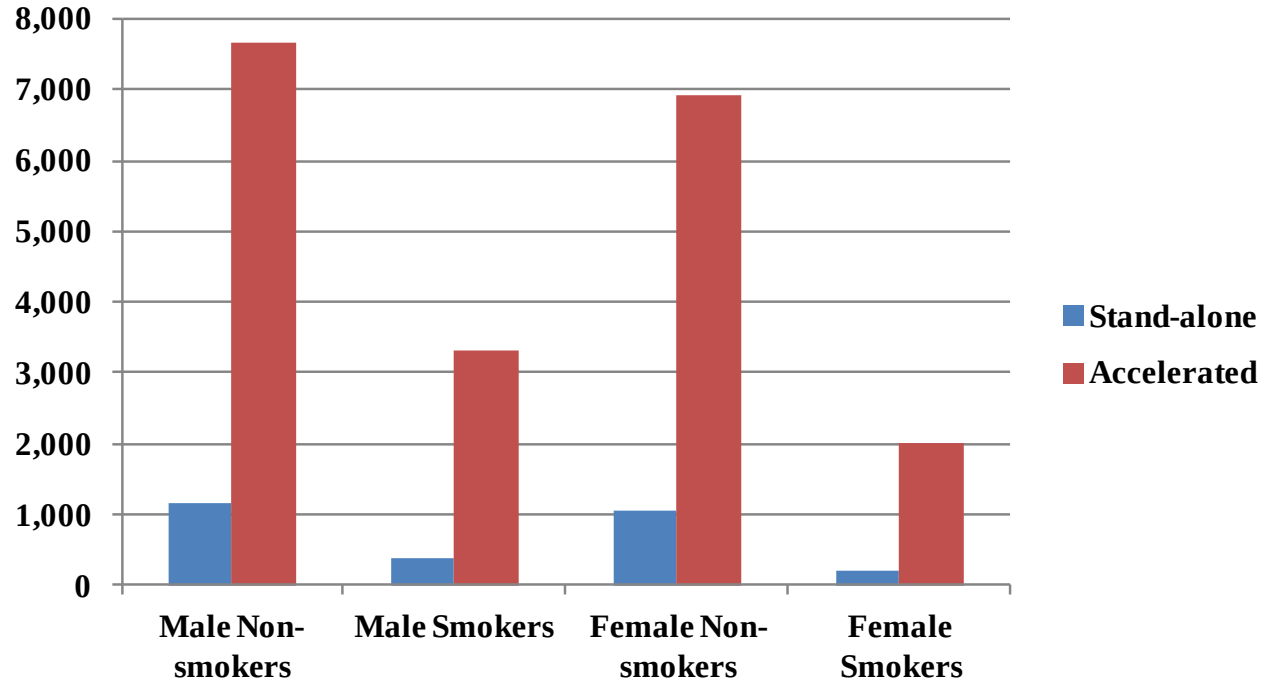


Figure 4.1 from Working Paper 58

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Supplementary Analysis – Imputed stand-alone rates

- Imputed rates by subtracting death-only rates from all-causes rates
- Derived at ultimate durations only
- Restricted age range between ages 30 and 60
- Not intended to represent an industry standard table

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Supplementary Analysis - Imputed stand-alone rates

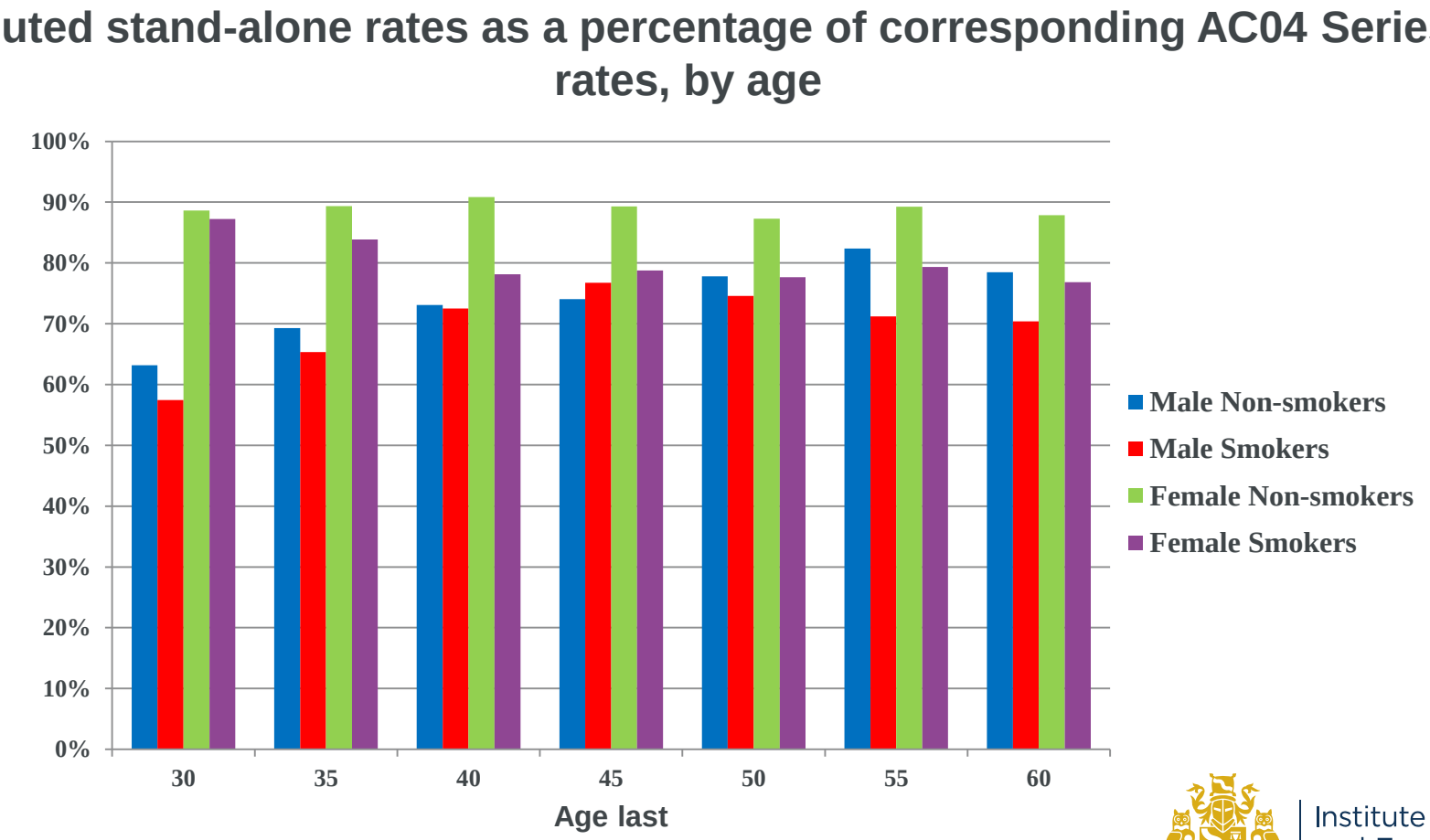


Figure 4.2 from Working Paper 58

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Supplementary Analysis – Imputed stand-alone rates

- All-durations, all-ages 100A/Es, for stand-alone business

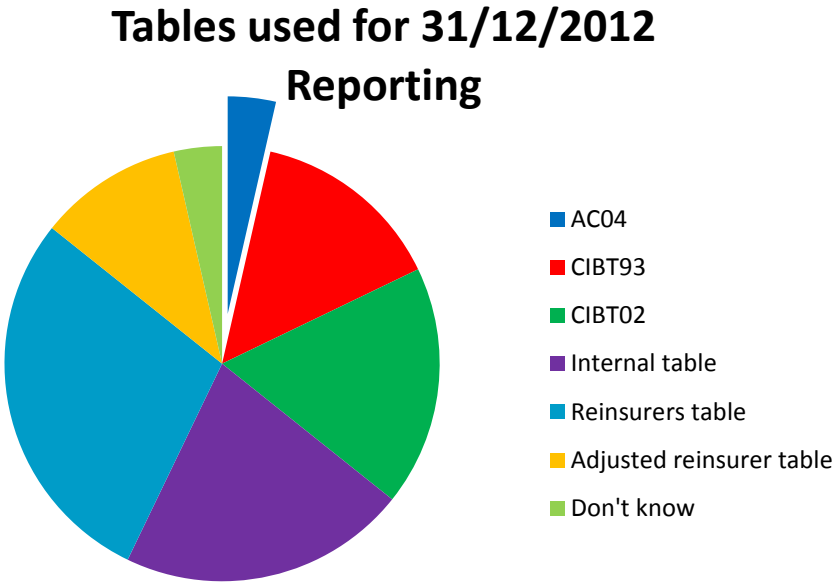
MNS	MS	FNS	FS	ALL
112%	123%	112%	107%	**113%**

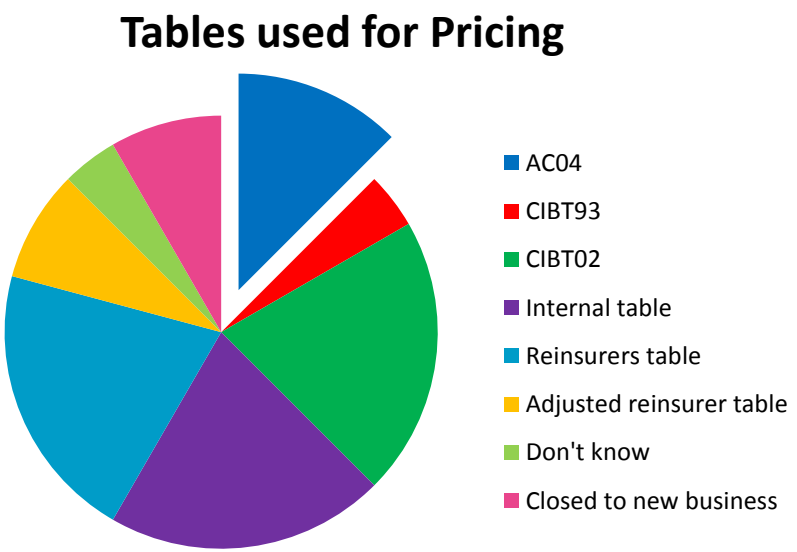
- Experience of stand-alone business appears to be heavier…
- But data volumes are low

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AC04 Consultation – Table usage

- 18 responses
  - 12 insurers, 5 reinsurers,1 anonymous





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AC04 Consultation – Comments

Table not approved by Actuarial Profession

Unable to identify robust evidence as to relationship between AC04 and claims experience for historic cohorts

Rates are not based on a stochastic/statistical model and this may lead to over-fitting

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AC04 Consultation – Requests

A set of final SACI tables to sit alongside the ACI ones

Data on claims experience under popular non-ABI conditions and impact of "ABI+" definitions. Also expected impact on future claims experience of older definitions

Child CI

More individual illness splits

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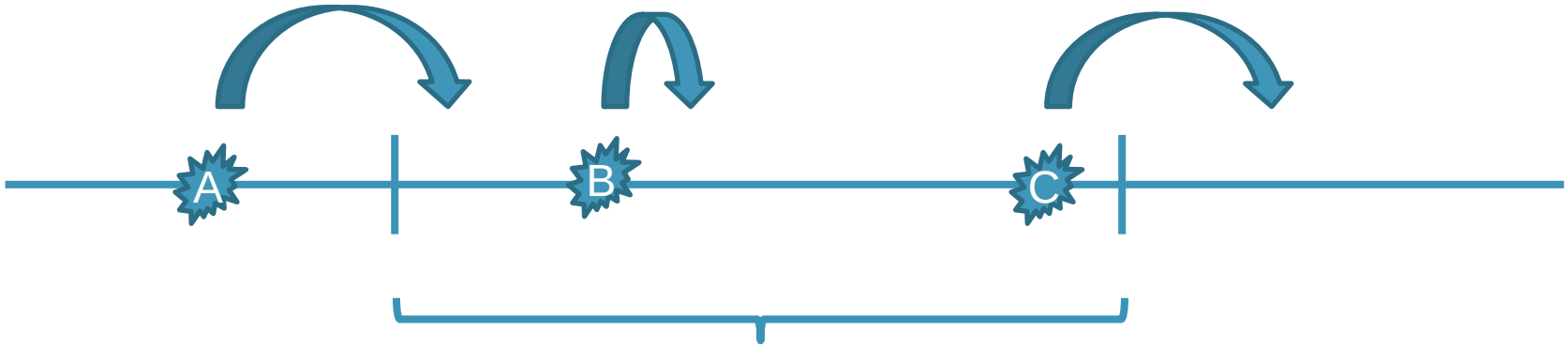
Changes to analysis methodology

ertise
onsorship
Thought leadership
Progress
Community
Sessional Meetings
Education
Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
Journals
Suppor

21 May 2013

CMI Critical Illness – key data issue

- CMI CI data / analysis problem:
  - Claims collected by year of settlement; diagnosis date often unknown; material lag from diagnosis to settlement
  - Lack of consistency between exposure and claims



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CMI Critical Illness – Results Methodology

- ‘Unadjusted Results’ / WP14 methodology
  - Actual Settled Claims v Expected Diagnosed Claims



  - Mismatch ... ‘Grossing-up factors’: issues in expanding claims set

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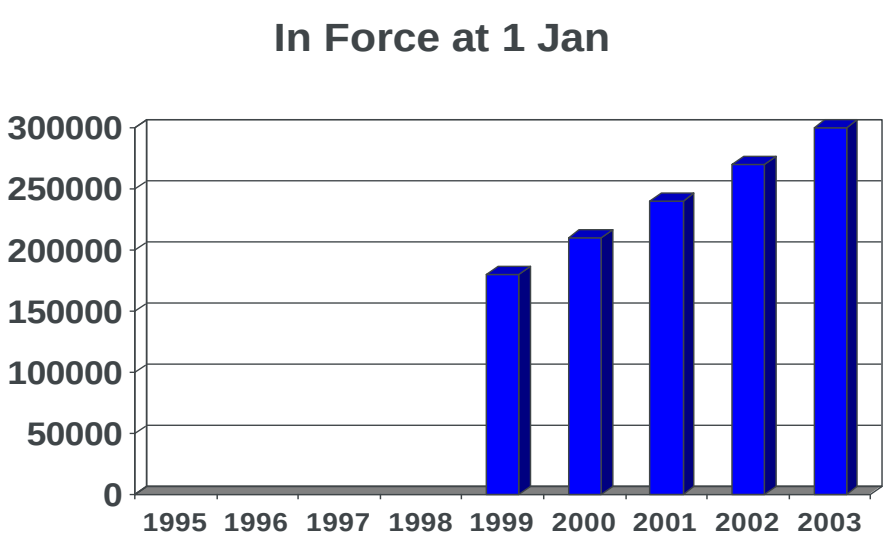
CMI Critical Illness - Results methodology

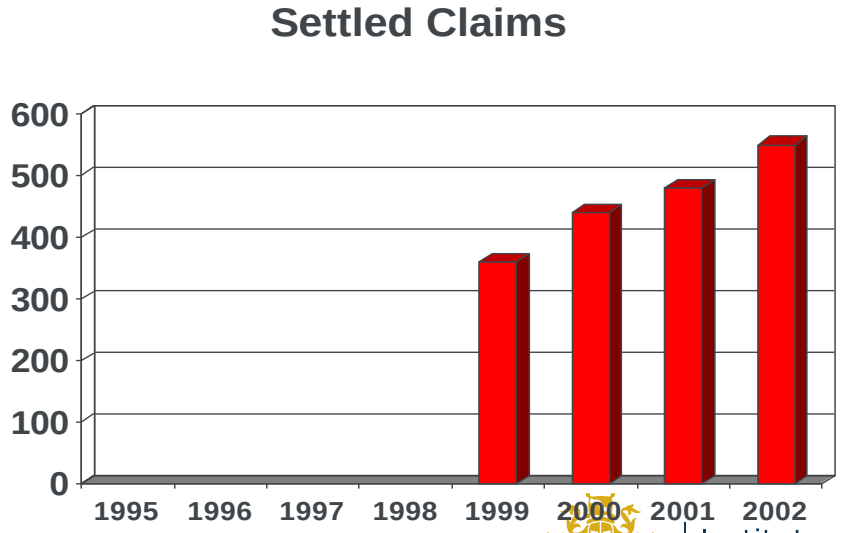
- ‘Unadjusted Results’ / WP14 methodology
  - Actual Settled Claims v Expected Diagnosed Claims
  - Mismatch ... ‘Grossing-up factors’
- ‘Adjusted Results’ / WP33 methodology
  - Actual Settled Claims v Expected Settled Claims
  - Match A & E, but presented using settlement timing
  - Also used as methodology for AC04 diagnosis rates

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CMI Critical Illness - WP33 Methodology

- CMI CI data / analysis problem:
  - Claims collected by year of settlement; diagnosis date often unknown; material lag from diagnosis to settlement
- Start with the known in-force and settled claims

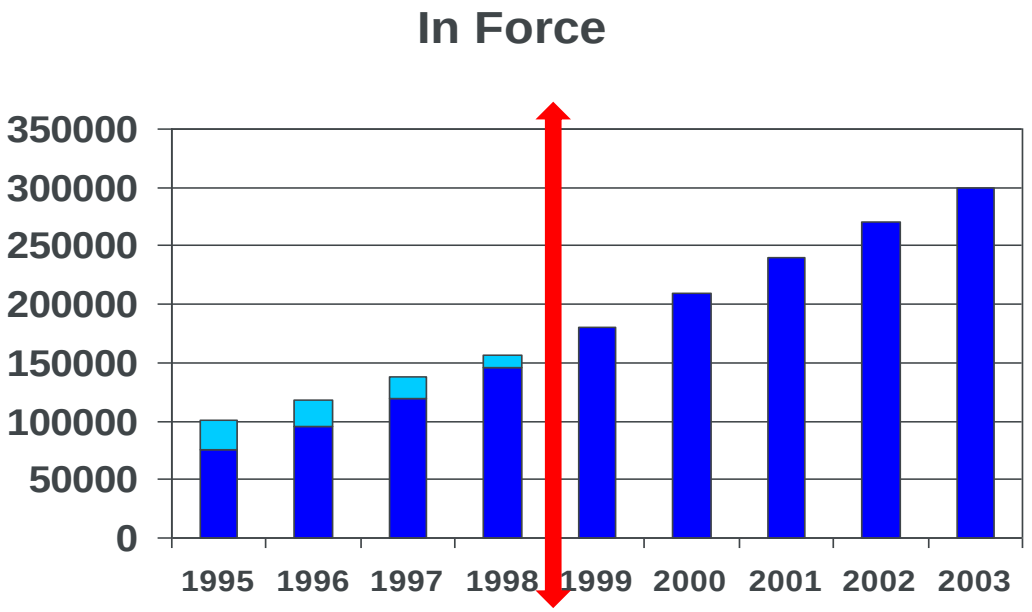




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CMI Critical Illness - WP33 Methodology

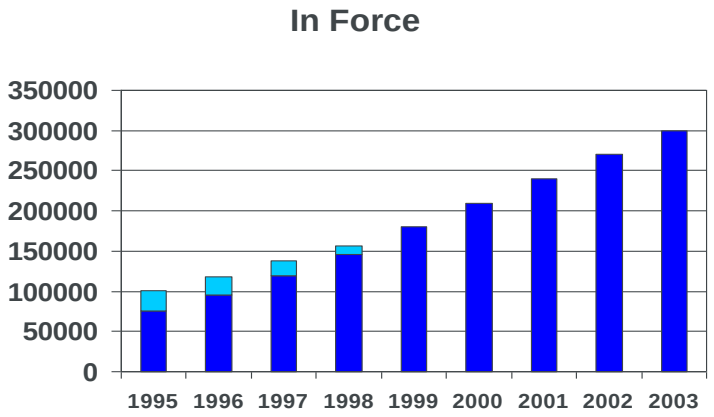
- From known in-force, estimate prior years in-force
  - Roll back known data (over time, age and duration)
  - Add back an estimate of business exiting before start date

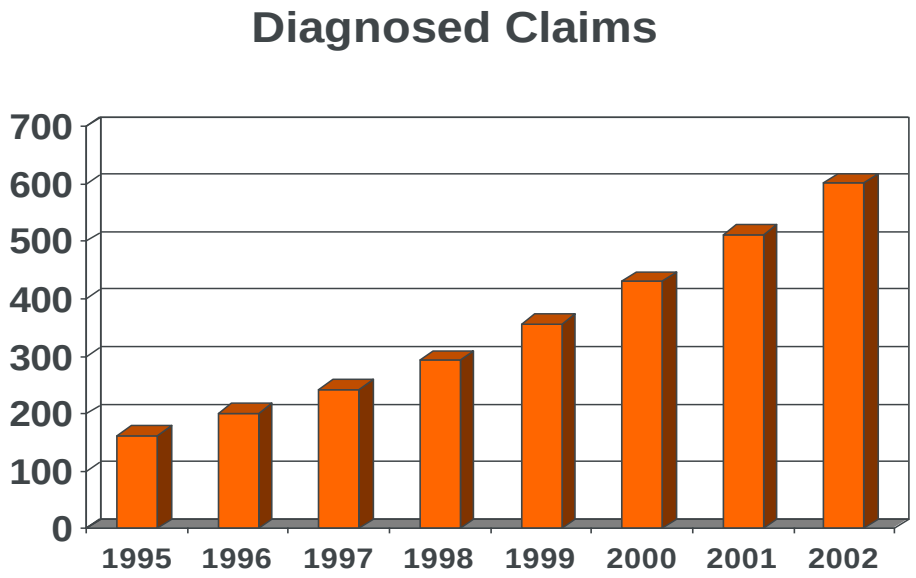


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CMI Critical Illness - WP33 Methodology

- From the in-force, estimate exposure in each year, then estimate diagnosed claims by year (at each age & duration) using an initial set of claim rates

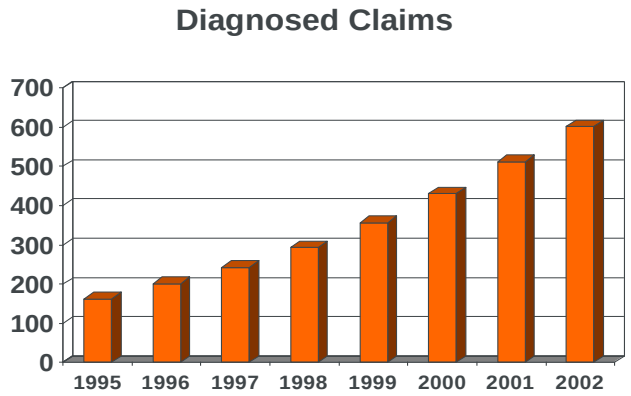




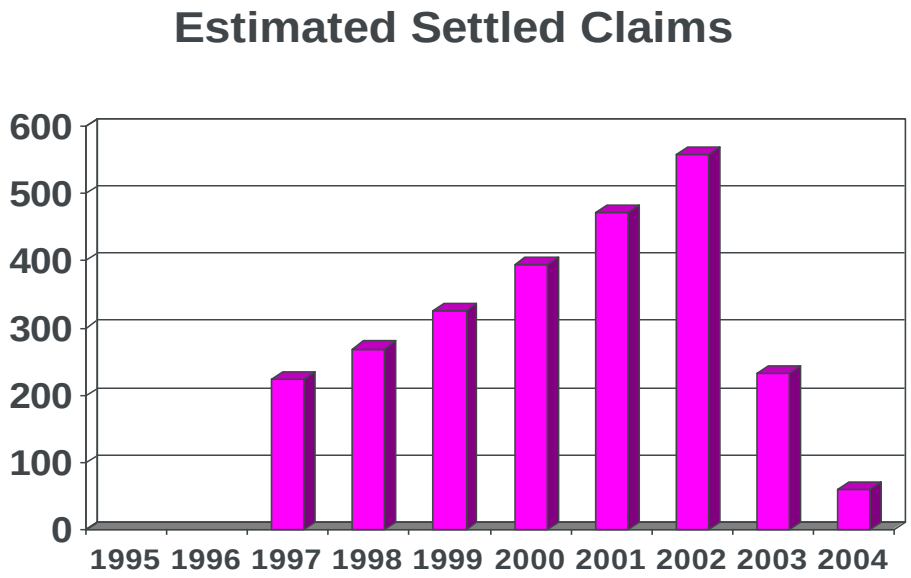
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CMI Critical Illness - WP33 Methodology

- From estimated diagnosed claims by year, estimate settled claims by year (by age & duration) using an assumed claim development distribution (CDD)





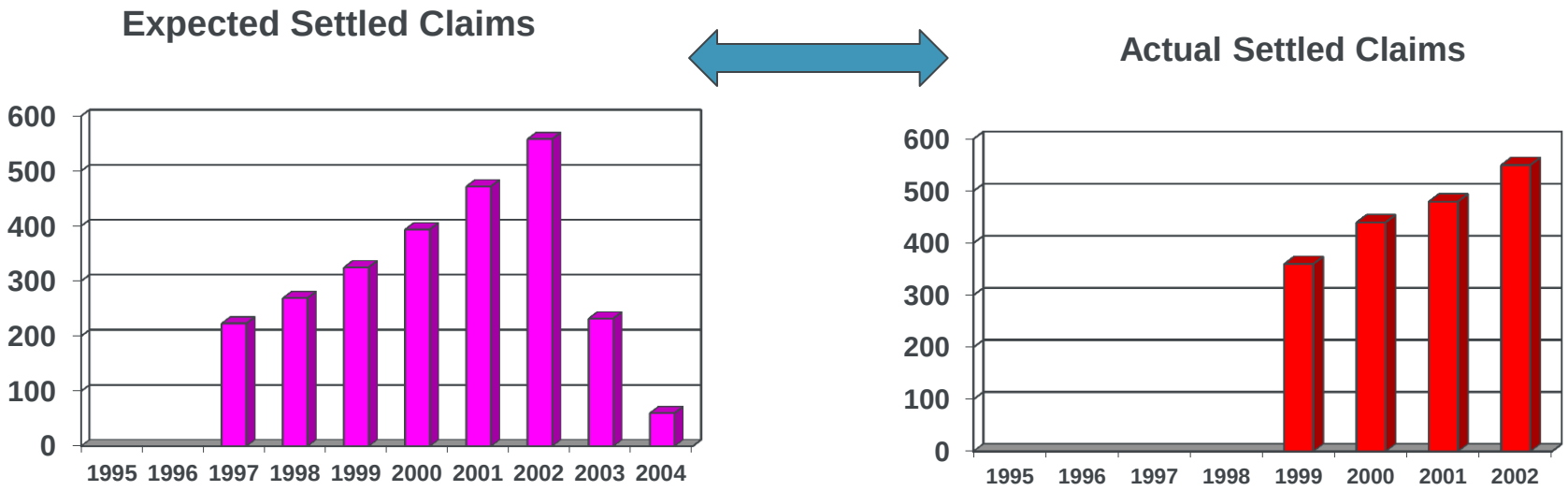


NB Max interval from diagnosis to settlement = 2 years in this illustration

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CMI Critical Illness - WP33 Methodology

- Compare estimate of expected settled claims in investigation period with known settled claims by year, age and duration



- Produces **'adjusted'** results (Actual Settled Claims/Expected Settled Claims), for a given base table and CDD

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Health Claims Forum initiative

- Instigated by the CMI, aimed to:
  - Increase frequency with which claims assessors recorded date of diagnosis
  - Standardise recording practices for date of diagnosis
- Date of diagnosis defined as "***the date at which the critical illness definition was fulfilled***" including establishment of permanency, where relevant
  - May result in date of diagnosis being later than previously => shorter delays?
- Guidance took effect from 01/01/2007
- Much better coverage in CMI data

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CMI Critical Illness - Results methodology

- ‘Unadjusted Results’ / WP14 methodology
  - Actual Settled Claims v Expected Diagnosed Claims
  - Mismatch ... ‘Grossing-up factors’
- ‘Adjusted Results’ / WP33 methodology
  - Actual Settled Claims v Expected Settled Claims
  - Match A & E, but presented using settlement timing
  - Also used as methodology for AC04 diagnosis rates
- Revised / WP67 methodology
  - Actual Diagnosed Claims v Expected Diagnosed Claims
  - Match A & E, but needs estimate of outstanding claims

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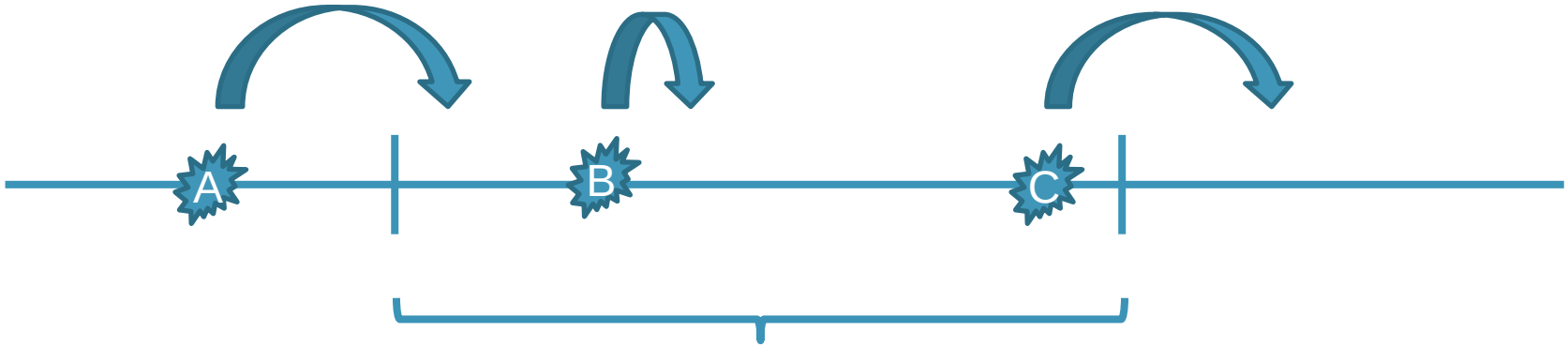
CMI Critical Illness – Revised methodology

- CMI CI data / analysis problem:
  - Claims collected by year of settlement; diagnosis date often unknown; material lag from diagnosis to settlement
- Start with the known in-force and settled claims
- Revised methodology uses:
  - In-force to estimate exposure in current period
  - Only claims diagnosed and settled in period are retained
  - Claims diagnosed in period but yet to be settled have to be estimated

ie introducing an IBNS methodology

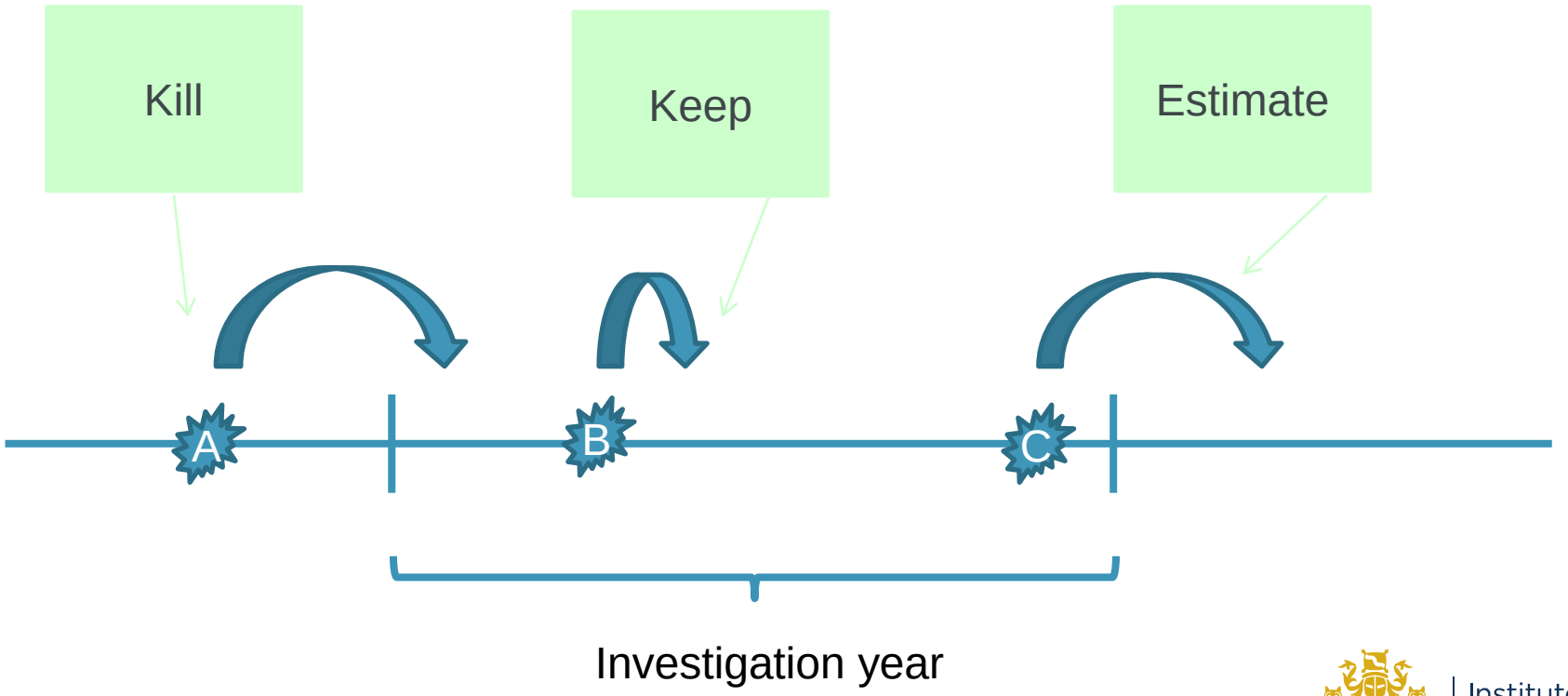
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CMI Critical Illness – Revised Methodology



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CMI Critical Illness – Revised Methodology



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CMI Critical Illness – IBNS methodology

- Simple approach adopted to calculate IBNS:
  - chain ladder approach to end of 4th year

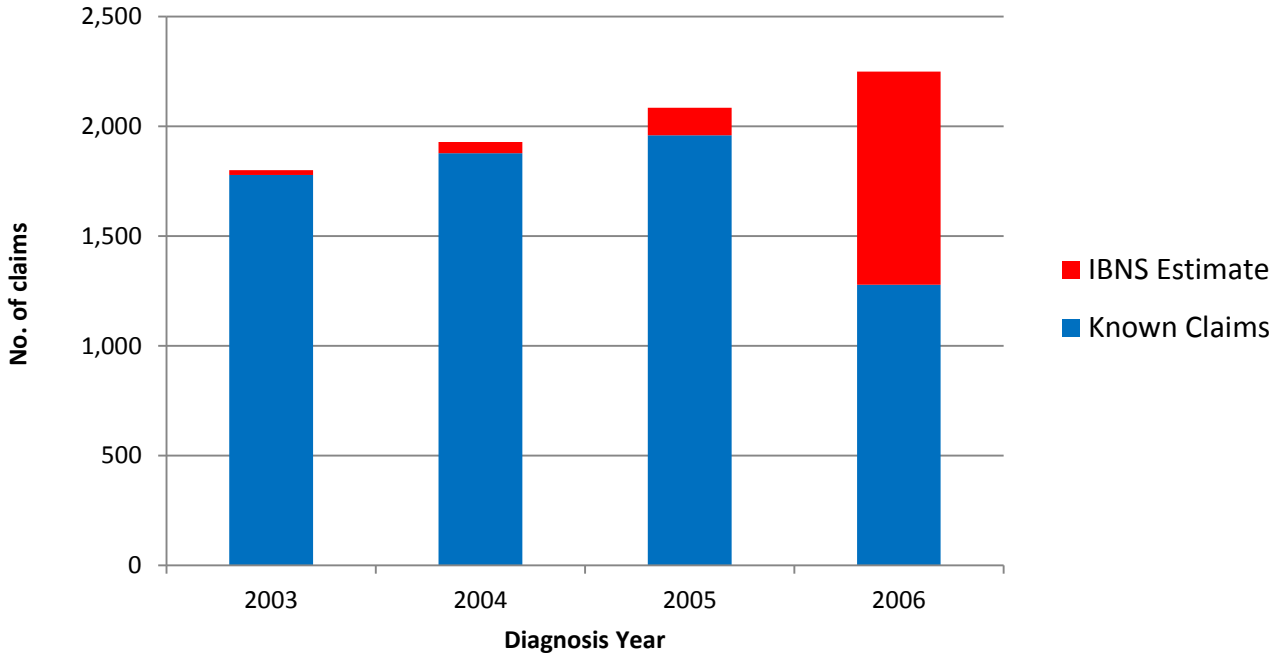
	Year of Settlement			
Diagnosis Year	1	2	3	4
2003	280	550	580	582
2004	370	690	700	
2005	660	800		
2006	500			
Development factor		1.557	1.032	1.003

  - CDD to estimate claims beyond 4th year

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CMI Critical Illness – Estimating IBNS

Known claims and IBNS estimate (at 31/12/2006) for male non-smokers for all offices combined



However, now have 2007 data for most offices and these can be used to replace much of the IBNS estimate….

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CMI Critical Illness – IBNS methodology

- Simple approach adopted to calculate IBNS:
  - chain ladder approach to end of 4th year

	Year of Settlement			
Diagnosis Year	1	2	3	4
2003	280	550	580	582
2004	370	690	700	
2005	660	800		
2006	500			
Development factor		1.557	1.032	1.003

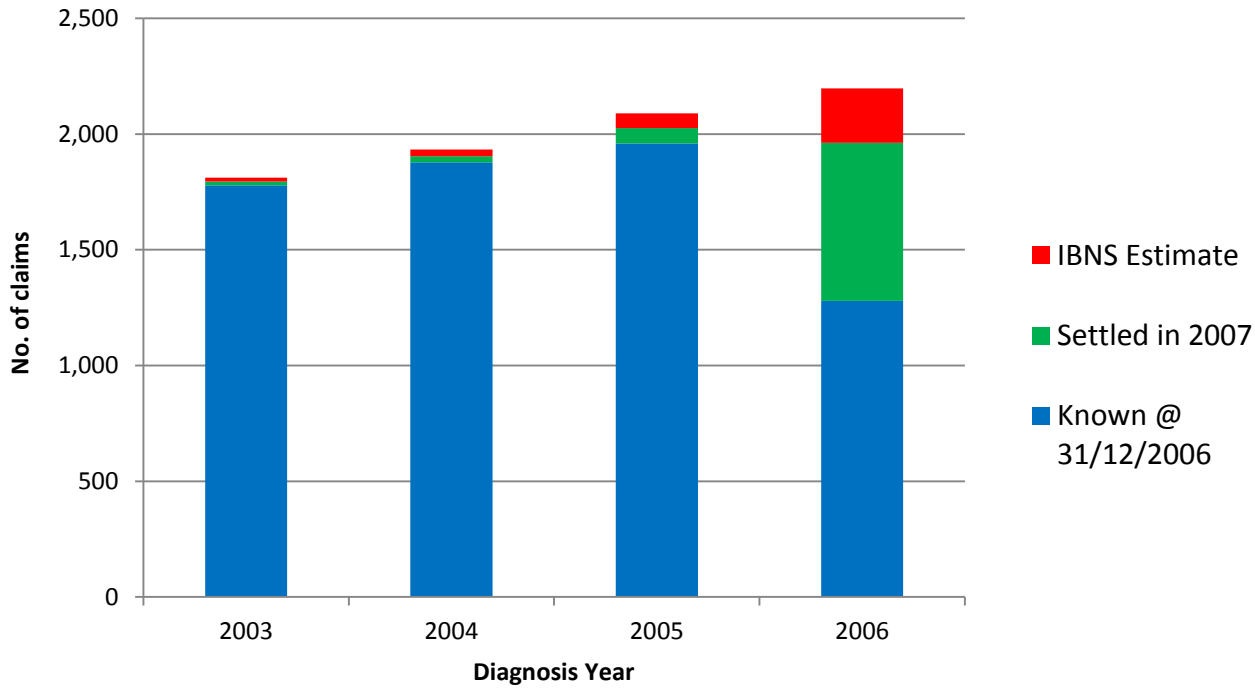
  - CDD to estimate claims beyond 4th year
- WP67 focus on demonstrating methodology (2003-06)
- Committee focus is on 2007-10 results

➡ IBNS less significant for both sets as later claims available

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CMI Critical Illness – Estimating IBNS

Known claims @ 31/12/2006, claims settled in 2007 and residual IBNS estimate for male non-smokers for all offices combined



- Similarly for 2007-10 results we will have 2011 claims

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CMI Critical Illness – 2003-2006 results

Estimated total claims and residual IBNS estimate for male non-smokers for all offices combined

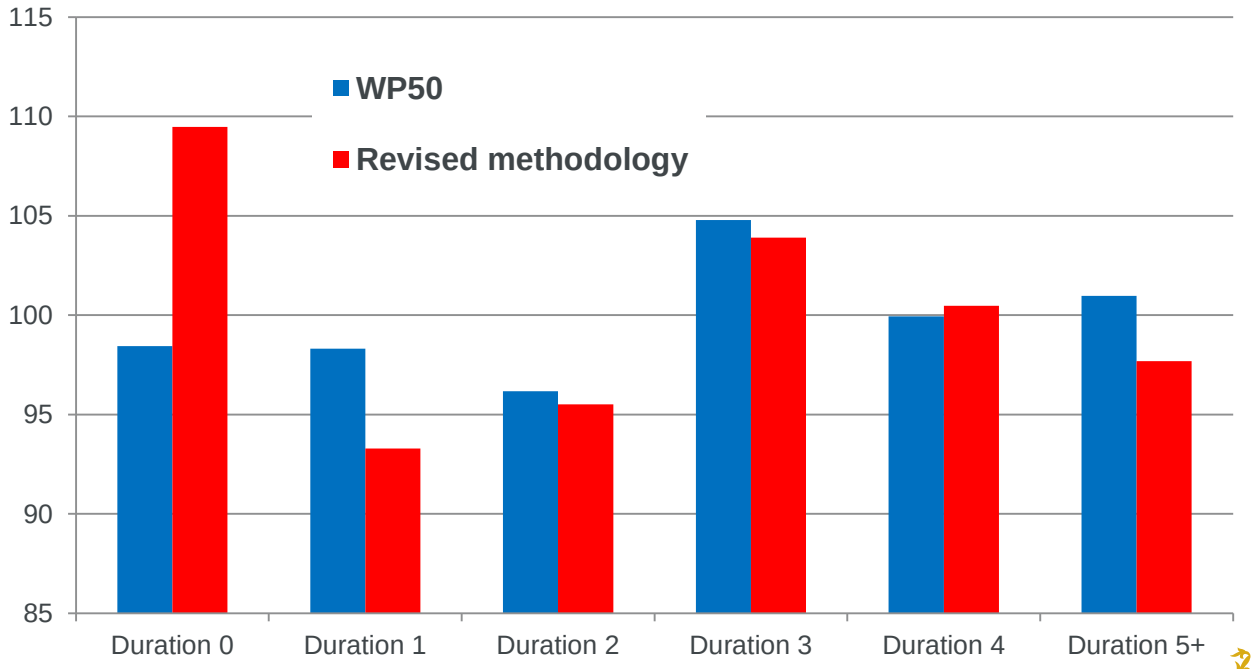
Dataset	Unadjusted results	Adjusted results	Revised Methodology		
			Without IBNS	Including initial IBNS estimate	Including revised IBNS estimate
MNS	95	100	85	99	99
MS	96	101	87	102	98
FNS	94	100	84	99	99
FS	96	100	86	101	97

Figure 5.4 from Working Paper 67

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CMI Critical Illness – 2003-2006 results

Comparison of the values of **100xActual Diagnosed Claims/Expected Diagnosed Claims** from Working Paper 50 against those calculated using AC04 rates and including estimated IBNS (replaced by 2007 settled claims, where known), by age and duration for MNS only



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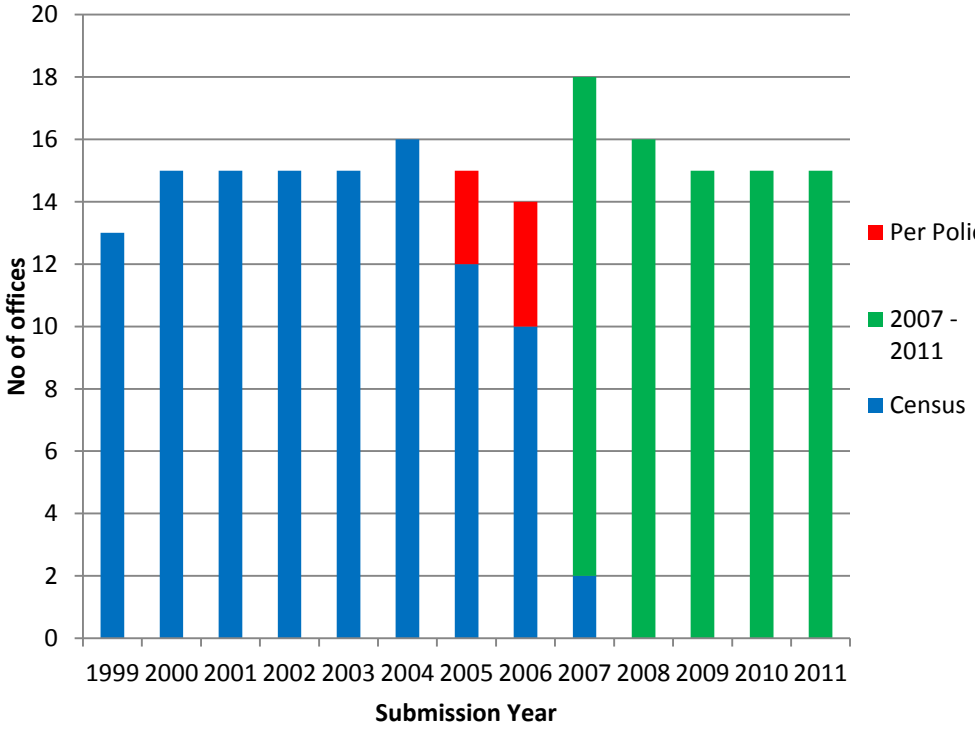
CMI Critical Illness – 2007-2011 data collection exercise

- Considerable concern over data collection:
  - Slow progress to Per Policy – data requirements over-ambitious;
  - All Office results out of date; and
  - Fall in market coverage for Life Office Mortality
  - Compounded by limited resources in offices (Solvency II etc)
- 2007-2011 data collection exercise – CI & Mortality
- Intended to make data submission as easy as possible
- Secretariat are still missing one very large dataset – which has been promised

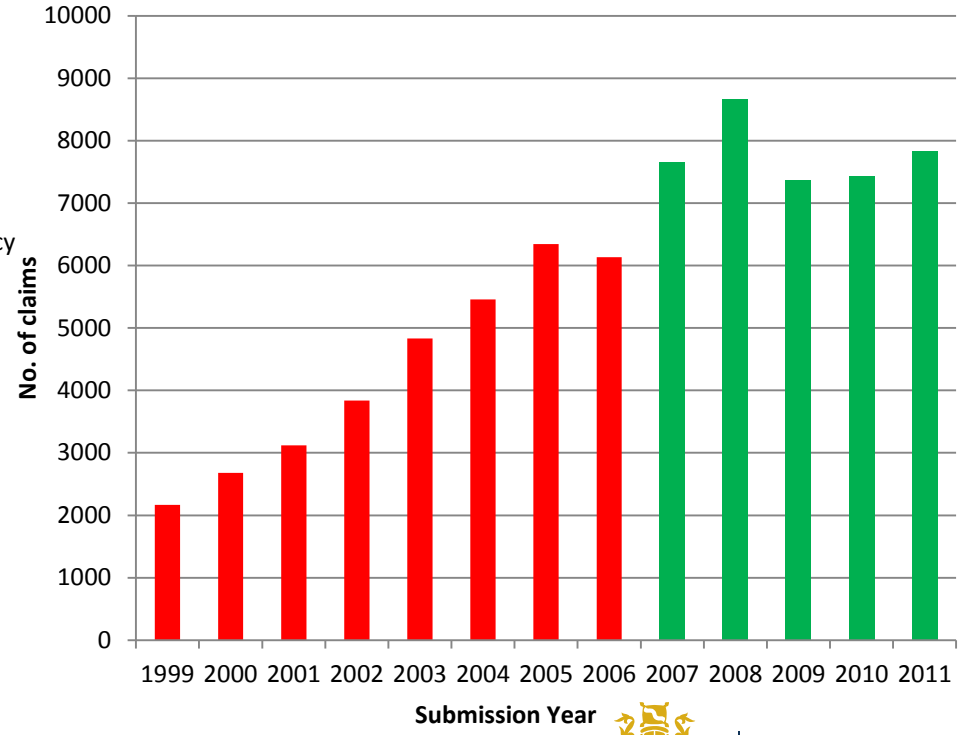
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CMI Critical Illness - 2007-2011 data collection exercise

Census vs Per Policy data submissions, by year



Number of Claims, by submission year



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CMI Critical Illness – 2007-2011 data collection exercise

- Summary results will be produced by:
  - Age (last birthday)
  - Duration (curtate)
  - Gender
  - Smoker status (where relevant)
  - Product category, as follows, applied separately to accelerated and stand-alone:
    - Endowment,
    - Whole Life,
    - Term split between Level, Increasing, Decreasing, FIB, Other and unknown;
  - Distribution channel.
- Using AC04 as comparison table.

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CMI Critical Illness: Future work

- 2007-2010 results
- Analysis by benefit amount, distribution channel, year of commencement, office and product type
- Compare with GLM/alternative techniques
- Investigate sensitivity of results to alternative approaches to:
  - Estimating IBNS (greater significance for annual results)
  - Estimates of dates of diagnosis, where not provided
- Collect 2012 data and produce results for 2011 and 2012.
- AC08 tables / Alternative graduation

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Questions

Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenters.

Any queries or feedback to ci@cmib.org.uk.

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