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A Users Guide to CMI CI Experience

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Users Guide to CMI

- Brief history of Industry CI Statistics
- Looking at CMI 1999-2002 Experience

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Brief History of Industry Statistics

1991-1997 CI HSG released in 2000
- Not CMI; a crude analysis ?

1998-2000 CMI released in 2003
- Figures flawed

1999-2002 CMI released in 2005
- Best effort yet ? Or still flawed ?

1999-2002 CMI Experience

- Overview of Data
- Credibility of Data
- Raw results
- Adjusting Results for IBNS
- Shape of emerging Selection
- Deeper Analyses
- Trends in the Quadrennium

Overview of Data

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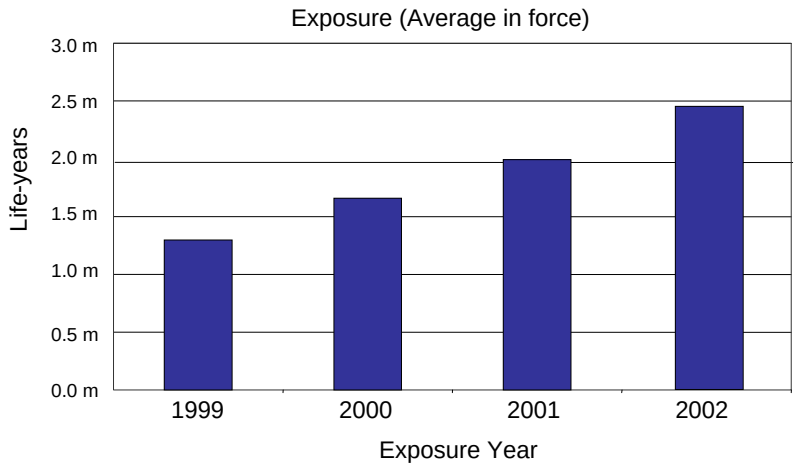
Exposure By Year 1999-2002



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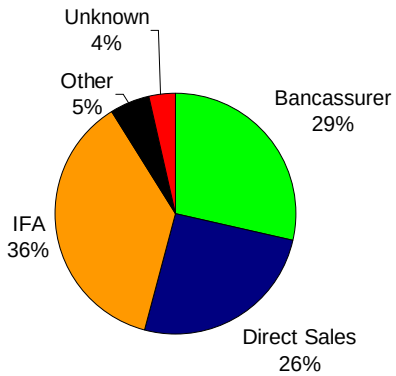
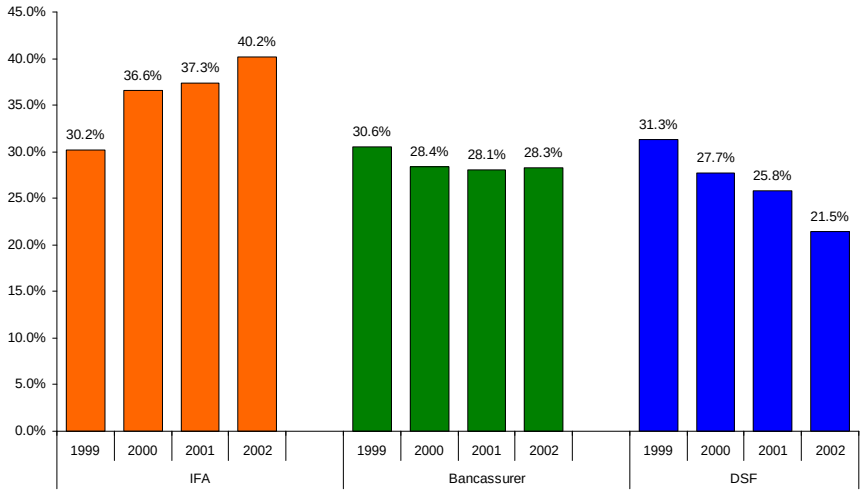
Leavers and Joiners 1999-2002

Number of Portfolios			
Year	Joining	Leaving	Included
1999	13	0	13
2000	5	1	17
2001	0	0	17
2002	1	0	18

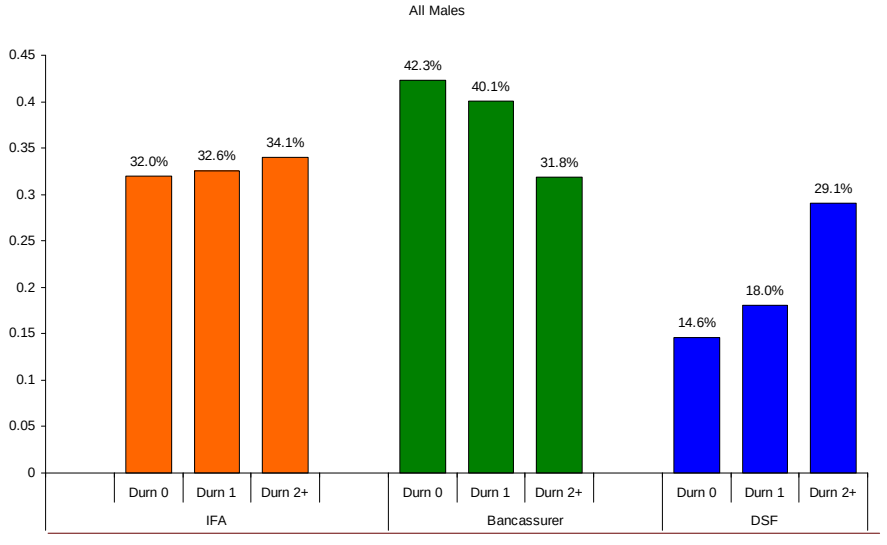
Split By Sales Channel 1999-2002



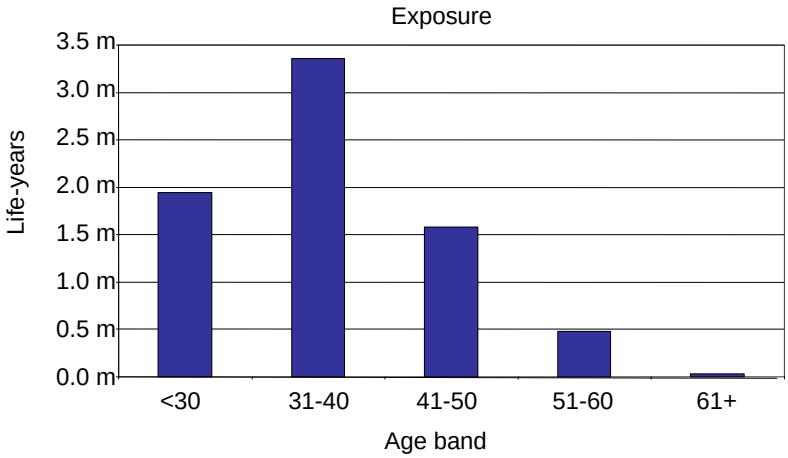
Channel Split By Year 1999-2002 (by Exposed SA)



Channel Split by Duration (males) 1999-2002



Exposure by Age Band 1999-2002



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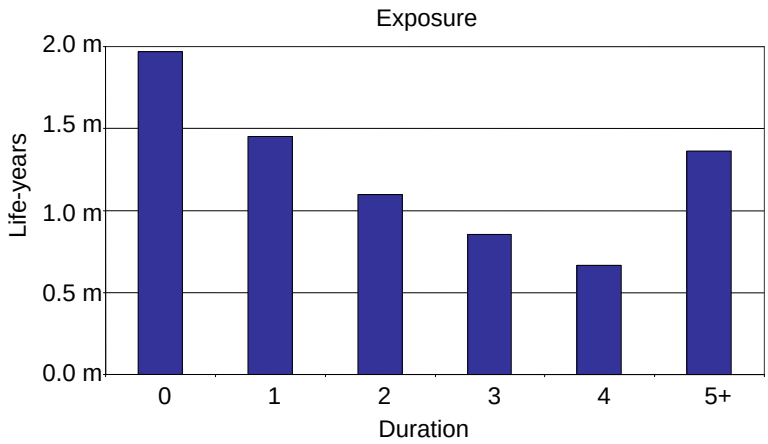
Exposure by Duration 1999-2002



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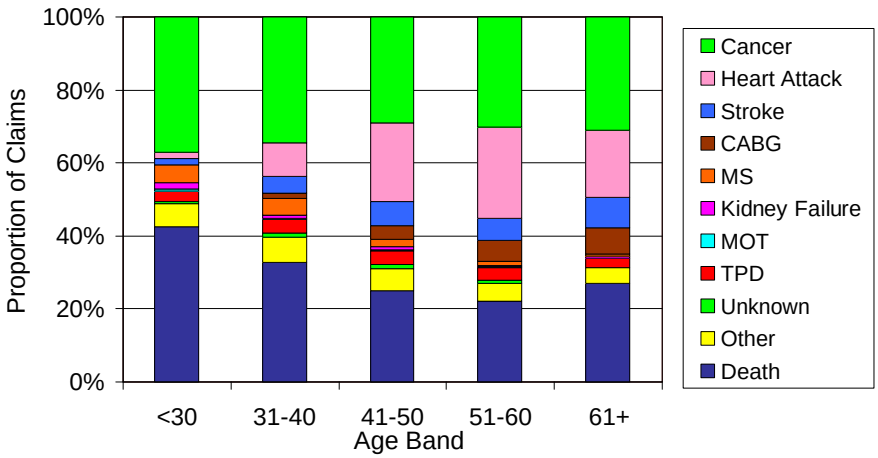
Claims by Cause and Age - Males



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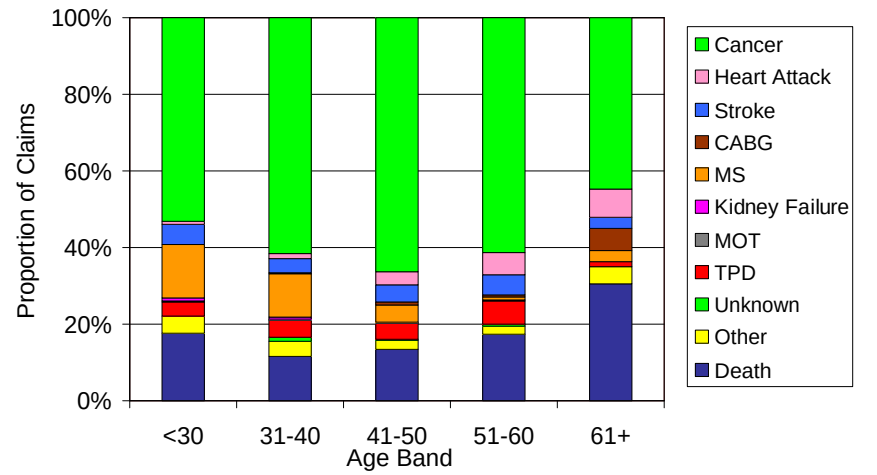
Claims by Cause and Age - Females



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Credibility

Number of Claims 1999-2002

Number of Claims		Number	% Split
Accelerated	CI Claims	7,978	67%
	Deaths	2,332	20%
		10,310	**87%**
Stand-Alone	CI Claims	1,493	13%
Total Claims		11,803	100%

Number of Claims by Category and Duration 1999-2002				
Duration	**MNS**	**MS**	**FNS**	**FS**
0	760	441	659	176
1	725	355	593	177
2	658	300	507	136
3	426	262	405	101
4	394	164	329	81
5+	1,198	370	764	208
Total	4,261	1,892	3,257	879

Number of Claims by Cause 1999-2002		
Cause	**No**	**% Split**
Cancer	4,526	43.9%
Heart Attack	1,157	11.2%
Stroke	526	5.1%
CABG	229	2.2%
MS	465	4.5%
Kidney Failure	59	0.6%
MOT	25	0.2%
TPD	404	3.9%
Death	2,332	22.6%
Other	495	4.8%
Unknown	92	0.9%
	10,310	**100.0%**

Number Claims by Cause and Age 1999-2002

Category	Age	Disease	No
MNS	31-40	Heart-Att	71
MNS	41-50	Heart-Att	214
MNS	51-60	Heart-Att	250
MNS	31-40	Cancer	450
MNS	41-50	Cancer	452
MNS	51-60	Cancer	380
FNS	31-40	Cancer	753
FNS	41-50	Cancer	757
FNS	51-60	Cancer	390

Raw Results

Raw A/E by Lives – Acceleration only – 1999-2002

All comparisons against CIBT93

	A / E (lives)			
Duration	**MNS**	**MS**	**FNS**	**FS**
0	31.0%	63.7%	40.6%	45.4%
1	37.3%	67.9%	46.4%	59.9%
2	42.6%	75.4%	49.7%	60.3%
3	41.4%	82.6%	48.0%	56.0%
4	37.2%	65.2%	46.9%	56.0%
5+	40.5%	64.5%	43.0%	65.7%
All	**38.0%**	**68.7%**	**45.0%**	**56.7%**

Raw Selection – Acceleration only – 1999-2002

	Raw Selection Pattern			
Duration	**MNS**	**MS**	**FNS**	**FS**
0	76.4%	98.7%	94.3%	69.1%
1	92.2%	105.2%	107.9%	91.2%
2	105.2%	116.8%	115.4%	91.8%
3	102.3%	128.0%	111.5%	85.2%
4	91.9%	101.0%	109.1%	85.2%
5+	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Adjusting Results for IBNS

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Adjusting for IBNS (Incurred but not Settled)

Facts about the way CMI data assembled :-

- Only *settled* claims are reported to CMI.
- Claims data carries *settled* date, but not always *incurred* date (only in 56% of cases).
- CMI decided to allocate claims to investigation years according to *settled* date, but record age / duration as at the inferred *incurred* date.
- For a growing business portfolio (as CMI), number of *settled* claims each year will lag number of *incurred* claims.

Therefore we must determine a “gross-up” factor for IBNS

CMI suggested 15% (1.15) overall

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Adjusting for IBNS (Incurred but not Settled)

Building Model for CMI "grossing up" – Inputs needed

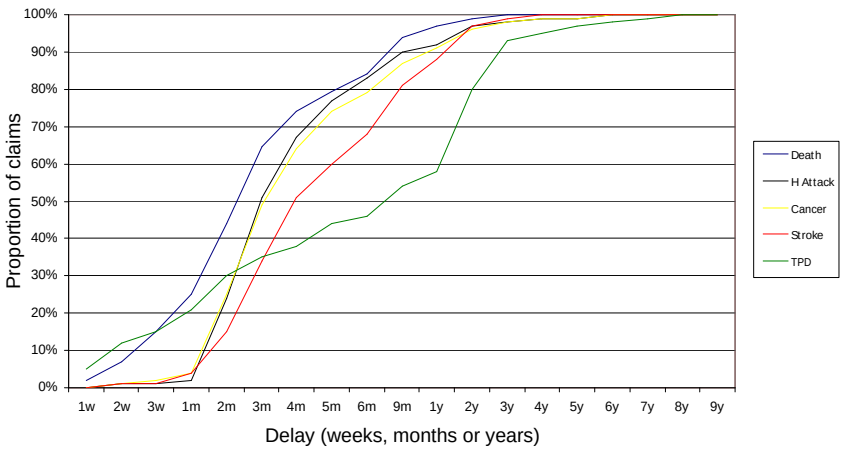
- Settlement delay pattern (mths from *incurral* to *settlement*).
- Model CMI new business growth by calendar year (1990 to 2002).
- Model lapse rates for CMI business.
- Average annual age-related growth in claims incidence.

Outputs from the Model

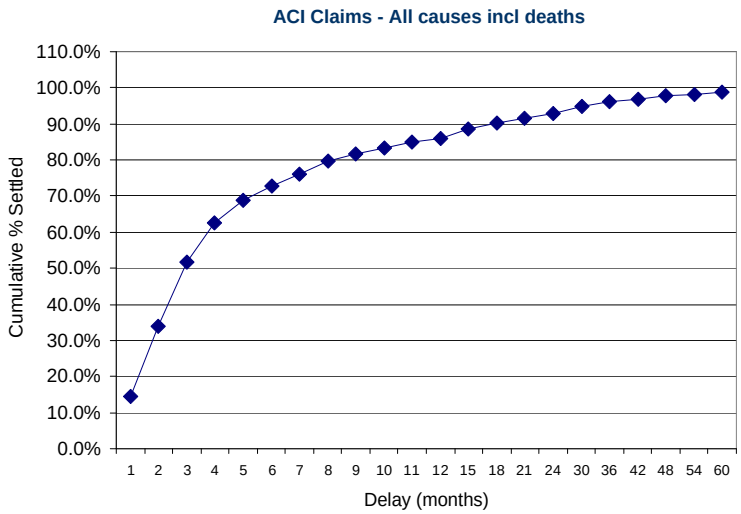
- Pattern of Expected Incurred Claims and Settled Claims by Year and Duration.
- Hence, "Gross-Up" factors (= Incurred / Settled) by Year (1999-2002) and Duration.

Adjusting for IBNS (Incurred but not Settled)

Delay Pattern, % settled within x months



Adjusting for IBNS (Incurred but not Settled)



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Adjusting for IBNS (Incurred but not Settled)

Acceleration Business

Model Gross-Up Factor, for each Calendar year, by Duration				
Duration (yrs)	**1999**	**2000**	**2001**	**2002**
0	1.09	1.08	1.09	1.13
1	1.11	1.09	1.08	1.09
2	1.19	1.11	1.09	1.08
3	1.24	1.19	1.11	1.09
4	1.20	1.24	1.19	1.11
5+	1.30	1.26	1.25	1.23
Total	**1.18**	**1.16**	**1.14**	**1.14**

Overall Average = 1.15

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Adjusting for IBNS (Incurred but not Settled)

Model "Gross-Ups" compared with Grimshaw

Calendar Year	1999	2000	2001	2002	All
Model	18%	16%	14%	14%	**15%**
Grimshaw	21%	22%	12%	12%	**15%**

Duration	0	1	2	3	4	5+	All
Model	10%	9%	11%	15%	18%	25%	**15%**
Grimshaw	13%	12%	14%	16%	18%	24%	**15%**

Adjusting for IBNS (Incurred but not Settled)

Theoretically, separate gross-up factors could be calculated by :-

- Investigation year
- Policy duration
- Stand Alone vs Acceleration
- CI condition
- Sum Assured level
- Sales channel
- Sex
- Age
- ????

Shape of Emerging Selection

Shape of Selection

Step 1

Adjust Raw A/E to exclude 'non-core' claims (ultimate duration data will have less of these).

Step 2

Gross up adjusted A/E by the appropriate duration-specific IBNS factors.

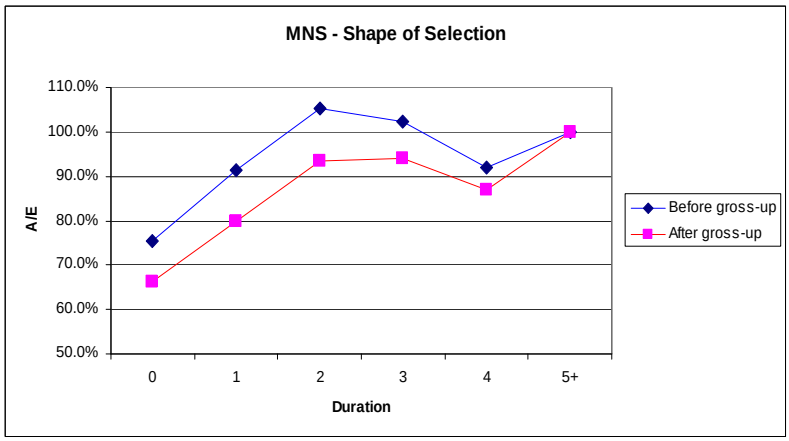
At the end of Step 2 we observe the shape of selection.

Shape of Selection

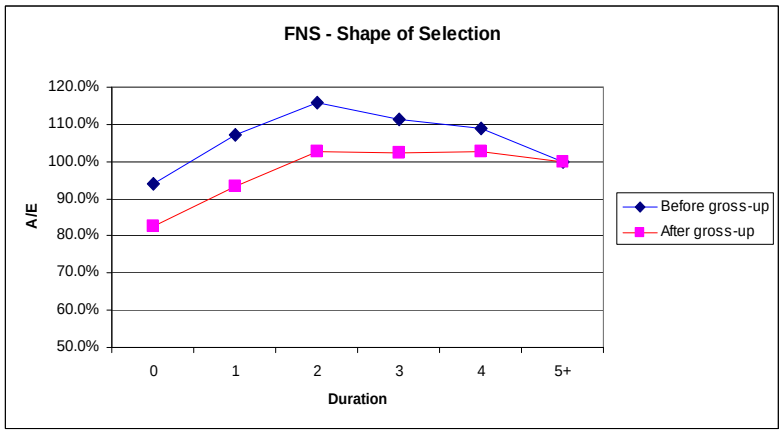
A/E Before and After Gross-Up for IBNS

	A / E (lives) Core Conditions			
Duration	MNS before	MNS after	FNS before	FNS after
0	28.7%	31.6%	39.2%	43.2%
1	34.8%	38.0%	44.7%	48.7%
2	40.0%	44.4%	48.3%	53.7%
3	38.9%	44.7%	46.5%	53.4%
4	35.0%	41.3%	45.5%	53.7%
5+	38.1%	47.6%	41.8%	52.2%

Shape of Selection



Shape of Selection



Shape of Selection

Possible distortions to the observed shape :-

- Ultimate duration data contains higher proportion DSF business
- Ultimate duration data may be heavier in poorly underwitten cases
- Ultimate duration data may contain more anti-select business.

So it may be inappropriate to apply the observed shape to pricing of new business today.

Deeper Analyses

1999-2002 by Sales Channel – Raw CMI data

Experience by Sales Channel* - by Amounts				
	Relative % to 'All'			
	MNS	**MS**	**FNS**	**FS**
Bancassurer	97%	117%	105%	115%
Direct Sales	114%	98%	116%	100%
IFA	95%	86%	88%	89%
Other	89%	54%	72%	58%
Unknown	73%	88%	93%	166%
All	**100%**	**100%**	**100%**	**100%**
*All durations, All Causes, Acceleration Business 1999-2002				

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Deeper Analyses

Distortions to raw sales-channel differentials :-

- IBNS gross-ups should differ by channel
- Different channels have differing proportions by duration

Channel differentials need adjusting for these distortions to make them suitable for pricing.

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Deeper Analyses

Amounts vs Lives Experience

	A / E		
Channel	**Amounts**	**Lives**	**Amts / Lives**
Bancassurer	48%	49%	**98%**
DSF	50%	50%	**100%**
IFA	39%	42%	**93%**
Other	31%	34%	**91%**
All	**45%**	**47%**	**96%**

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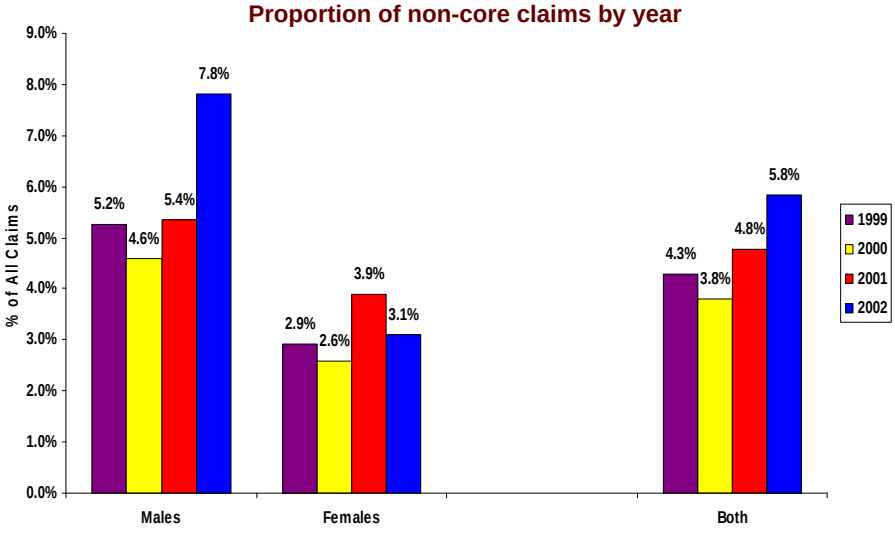
Deeper Analyses

Proportion of non-core claims by year



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Trends in the Quadrennium

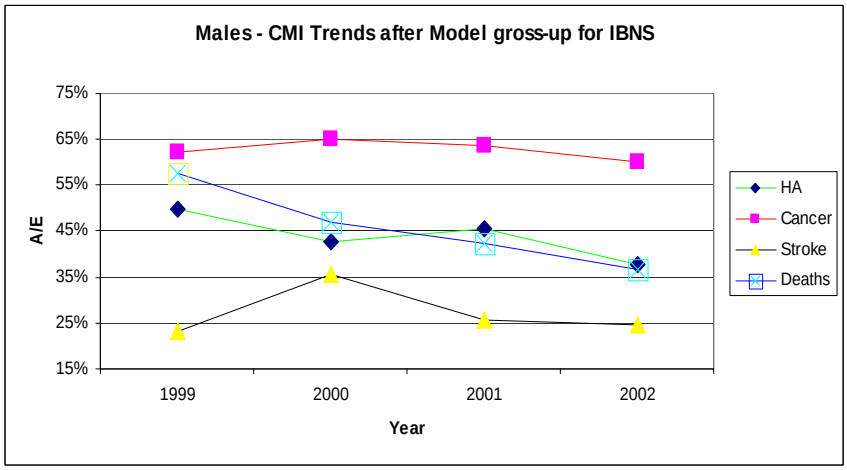
Trends in the Quadrennium

All Claims – All Durations

MNS	A / E Lives			
	1999	2000	2001	2002
CMI Raw Results	40%	39%	39%	35%
Model gross-up	47%	45%	44%	40%
Grimshaw gross-up	48%	48%	44%	39%

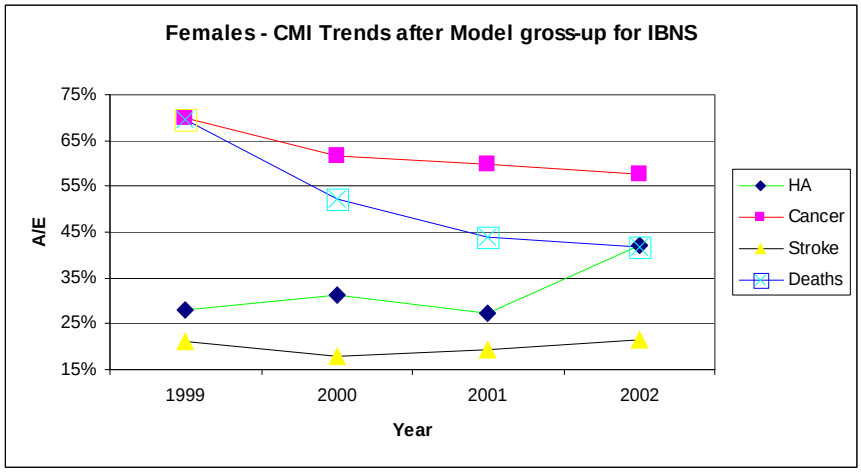
FNS	A / E Lives			
	1999	2000	2001	2002
CMI Raw Results	52%	46%	42%	43%
Model gross-up	61%	53%	48%	49%
Grimshaw gross-up	63%	56%	47%	48%

Trends in the Quadrennium



Why did they stop dying ?

Trends in the Quadrennium



Why did they stop dying ?