CMI Critical Illness Investigation

Learning From Experience

Healthcare Conference: 9-11 May 2007, Manchester

David Heeney
Hamish Wilson

Agenda

- **"Official" View**

- **Practitioner's Perspective**

Agenda

- ## "Official" View

  - ### Recap of CI Investigation objectives

  - ### Key challenges and recent progress

  - ### Results Update and next steps

- ## Practitioner's Perspective

Agenda

- **"Official" View**
  - **Recap of CI Investigation objectives**
  - **Key challenges and recent progress**
  - **Results Update and next steps**

- **Practitioner's Perspective**
  - **What do we provide vs what do we get back?**
  - **Key issues life offices need to address**
  - **Opportunities and priorities for improvement**

CMI Critical Illness Investigation

Learning From Experience – "Official" View

Healthcare Conference: 9-11 May 2007, Manchester

David Heeney

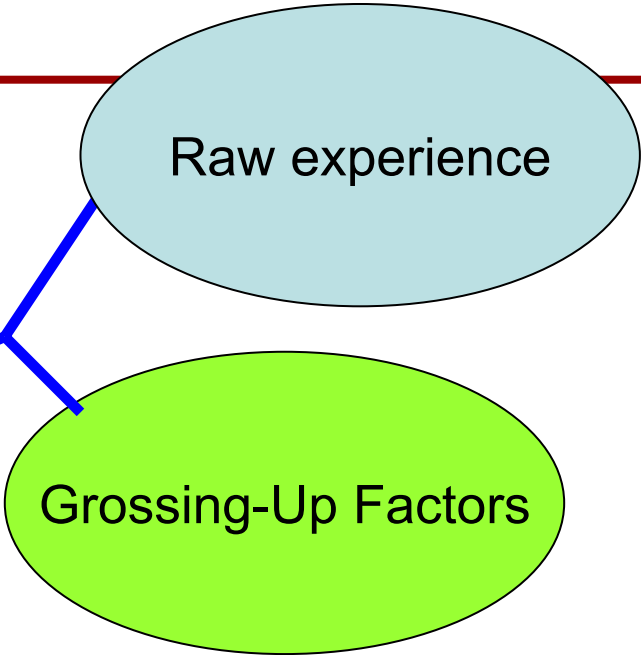*Chairman, CMI Critical Illness Committee*

Agenda

- **Recap of CI Investigation Objectives**

- **Key Challenges and Recent Progress**

- **Results Update**

- **Next Steps**

Where are we going?

Age x	Duration 0	Duration 1	Duration 2	Duration 3	Dur
17	0.000193	0.000251	0.000294	0.000337	0.0
18	0.000194	0.000251	0.000295	0.000338	0.0
19	0.000195	0.000253	0.000297	0.000340	0.0
20	0.000196	0.000254	0.000298	0.000342	0.0
21	0.000197	0.000256	0.000300	0.000344	0.0
22	0.000199	0.000258	0.000302	0.000347	0.0
23	0.000200	0.000260	0.000305	0.000350	0.0
24	0.000202	0.000263	0.000308	0.000353	0.0
25	0.000204	0.000265	0.000311	0.000357	0.0
26	0.000207	0.000269	0.000316	0.000362	0.0
27	0.000211	0.000274	0.000321	0.000368	0.0
28	0.000214	0.000278	0.000326	0.000374	0.0
29	0.000220	0.000285	0.000334	0.000383	0.0
30	0.000227	0.000294	0.000344	0.000394	0.0
31	0.000237	0.000306	0.000357	0.000409	0.0
32	0.000250	0.000320	0.000373	0.000426	0.0
33	0.000264	0.000337	0.000391	0.000446	0.0
34	0.000280	0.000355	0.000412	0.000469	0.0
35	0.000297	0.000376	0.000435	0.000494	0.0
36	0.000315	0.000398	0.000459	0.000521	0.0

How do we get there?

Age x	Duration 0	Duration 1	Duration 2	Duration 3	Dur
17	0.000193	0.000251	0.000294	0.000337	0.0
18	0.000194	0.000251	0.000295	0.000338	0.0
19	0.000195	0.000253	0.000297	0.000340	0.0
20	0.000196	0.000254	0.000298	0.000342	0.0
21	0.000197	0.000256	0.000300	0.000344	0.0
22	0.000199	0.000258	0.000303	0.000347	0.0
23	0.000200	0.000260	0.000305	0.000350	0.0
24	0.000202	0.000263	0.000308	0.000353	0.0
25	0.000204	0.000265	0.000311	0.000357	0.0
26	0.000207	0.000269	0.000316	0.000362	0.0
27	0.000211	0.000274	0.000321	0.000368	0.0
28	0.000214	0.000278	0.000326	0.000374	0.0
29	0.000220	0.000285	0.000334	0.000383	0.0
30	0.000227	0.000294	0.000344	0.000394	0.0
31	0.000237	0.000306	0.000357	0.000409	0.0
32	0.000250	0.000320	0.000373	0.000426	0.0
33	0.000264	0.000337	0.000391	0.000446	0.0
34	0.000280	0.000355	0.000412	0.000469	0.0
35	0.000297	0.000376	0.000435	0.000494	0.0
36	0.000315	0.000398	0.000459	0.000521	0.0

Raw experience

Grossing-Up Factors

Are we there yet?

- **Results for 1999, 2000, 2001, 2002 & quad released in May 2005**

- **Working Paper 14:**
  - **Detailed methodology underlying 1999-2002 results**
  - **Estimate of overall grossing-up factor**

- **Working Paper 18:**
  - **Responses to feedback on WP14**
  - **Reasons for not graduating (yet)**

- **1999-2002 data available to CMI members**

- **Working Paper 19: "Per-Policy" data submission**

- **2003 Results released in April 2006**

Agenda

- **Recap of CI Investigation Objectives**

- **Key Challenges and Recent Progress**

- **Results Update**

- **Next Steps**

Agenda

- **Recap of CI Investigation Objectives**

- **Key Challenges and Recent Progress**
  - **claim delays**
  - **business growth**
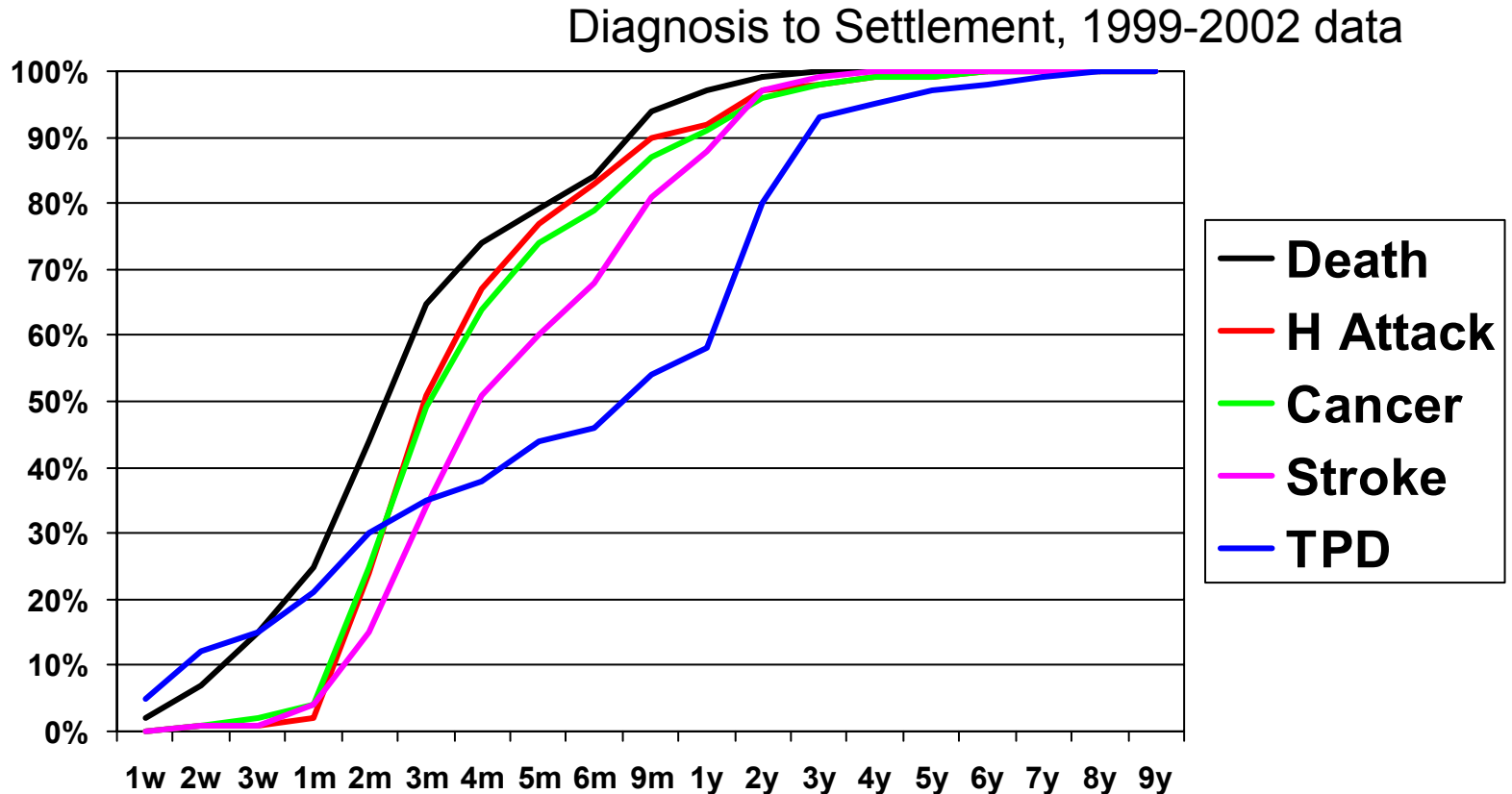 - **claim date definitions**

- **Results Update**

- **Next Steps**

Claims typically take 6 months to settle

- Approx. observed delays between claim dates:

  - Date of Diagnosis

    | 114 days |

  - Date of Notification

    | 55 days |

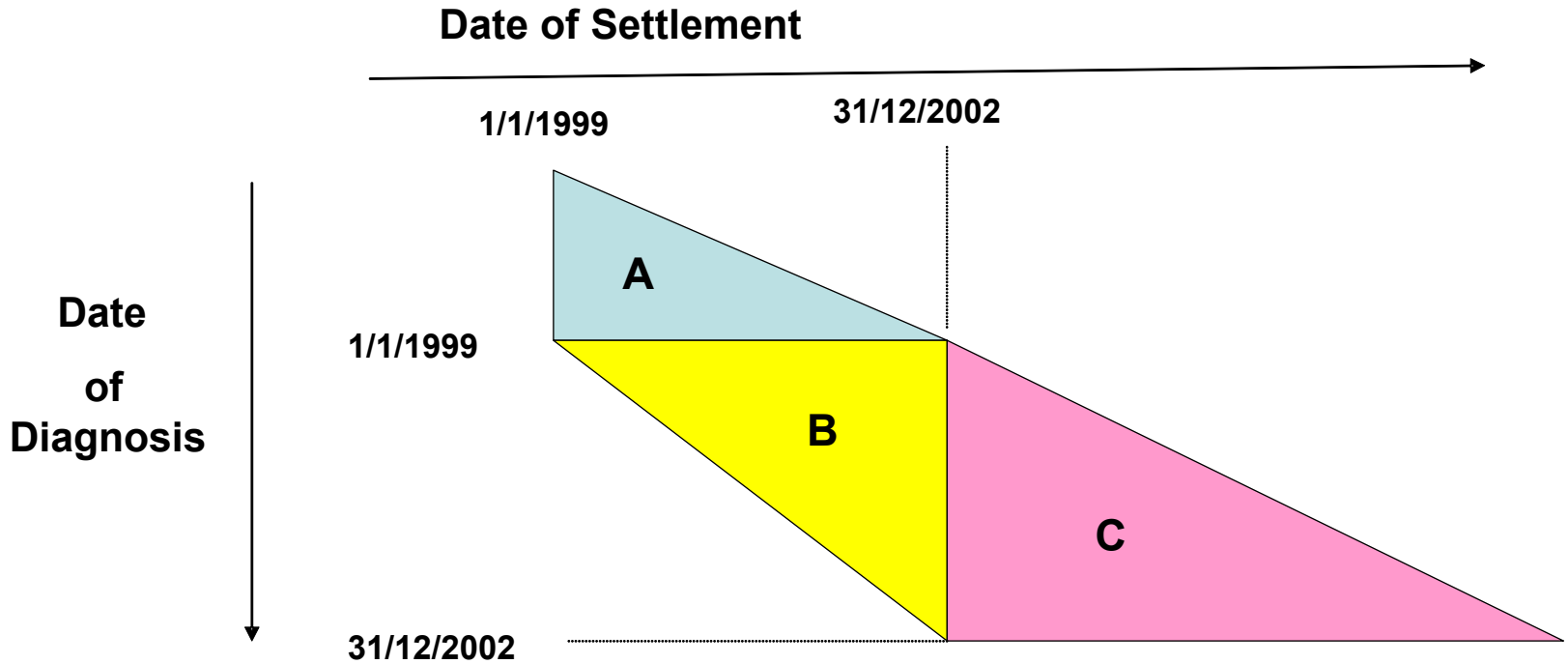 - Date of Admittance

    | 7 days |

  - Date of Settlement
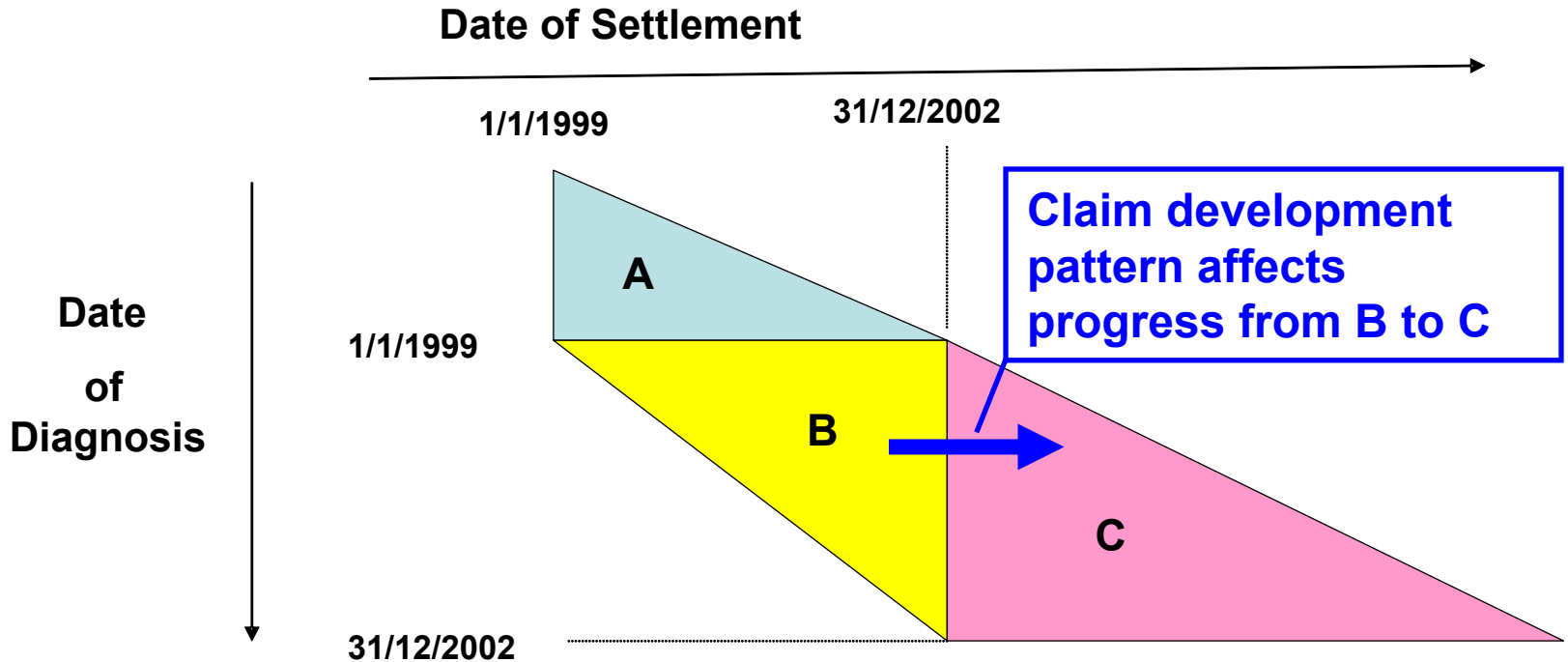
But delay patterns vary by cause

Diagnosis to Settlement, 1999-2002 data

Legend:
- **Death** (black)
- **H Attack** (red)
- **Cancer** (green)
- **Stroke** (magenta)
- **TPD** (blue)

And often we only have settlement date

- Date of diagnosis is estimated where not known
- The date of diagnosis is used to correctly calculate the age and duration but not to re-allocate claims in or out of the analysis
- This would not be a major issue with a stable portfolio
- BUT VOLUMES HAVE INCREASED RAPIDLY
- The effect of this is that 1999-2002 results are under-stated by a factor of the order of 15%
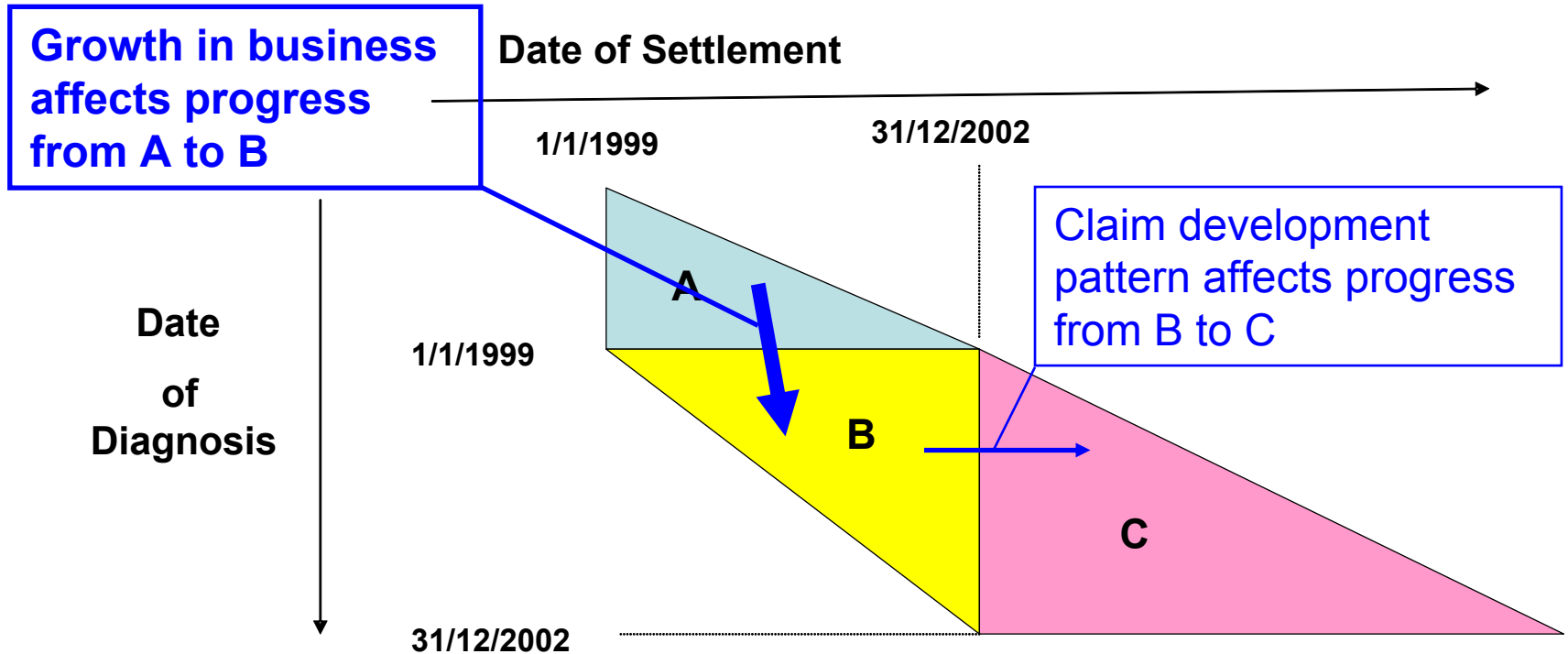- This factor will vary between offices according to the growth rate in their claims portfolio
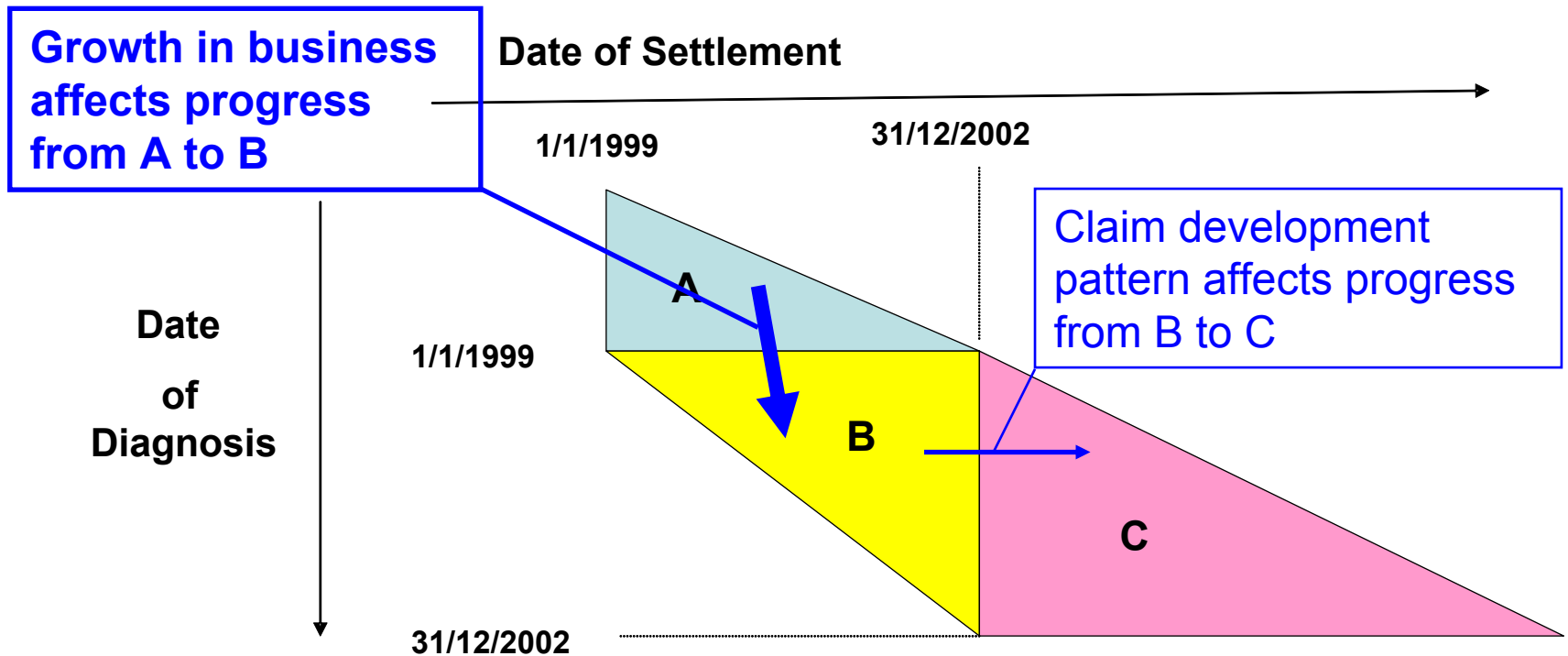
Date of Diagnosis v Date of Settlement

Date of Diagnosis v Date of Settlement
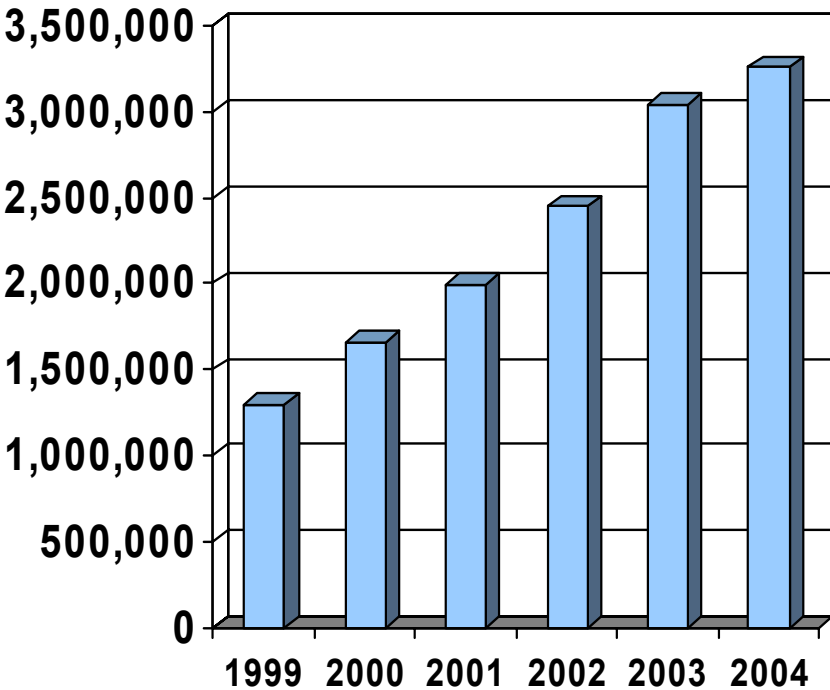
Date of Diagnosis v Date of Settlement

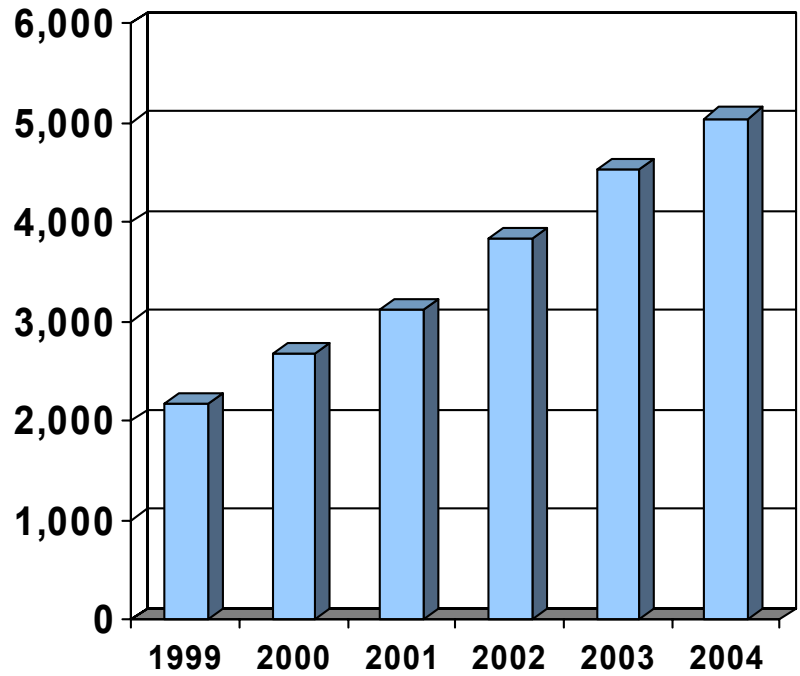**Growth in business affects progress from A to B**

Date of Settlement

1/1/1999

31/12/2002

Claim development pattern affects progress from B to C

Date

of

Diagnosis

1/1/1999

31/12/2002

A

B

C

Date of Diagnosis v Date of Settlement

Growth in business affects progress from A to B

Date of Settlement

1/1/1999   31/12/2002

Date

of

Diagnosis

1/1/1999

31/12/2002

A

B

C

Claim development pattern affects progress from B to C

(A + B) x (1 + grossing-up factor) = (B + C)

Growing Exposure 1999-2004

The Actuarial Profession
making financial sense of the future

The title has changed to 1999-2004 rather than 1999-2003.

The graphs have been revised in respect of 2003 and 2004 numbers have been added.

jxb, 03/04/2007

Impact of growth in exposure on Grossing-Up Factors

• **Guidelines provided in Working Paper 14:**

Rate of growth in expected claims	Approximate grossing-up factor
Nil	100%
10%	107%
20%	112%
30%	117%
50%	124%
75%	132%
100%	139%

# Health Claims Forum consultation

Definition:

> The date of diagnosis is **the date at which the critical illness definition was fulfilled**

Key Points:

- **Interpretation specified for April 2006 ABI definitions**
- **Companies asked to adapt these for older and non-ABI definitions -**
  - **Where there is a clear event date – use that (e.g. Heart Attack)**
  - **Where it is a degenerative disease then allow for permanence to be established**
- **Adoption date: 1st January 2007**

Health Claims Forum Consultation – the future

- **Adoption of HCF guidelines will:**
  - **improve consistency between offices**
  - **improve consistency over time with offices**
 - **increase recording of 'Date of Diagnosis'**
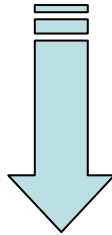
*Lower risk of error due to estimating diagnosis dates from settled claims*

Grossing-up factors: method used to date

- **Use claims where we know:**
  - **date of diagnosis, and**
  - **year of settlement**

  to estimate a claim development pattern

- **Try to use only consistent data submissions**

- **Each additional year's data:**
  - **Provides additional information from which to estimate development pattern**
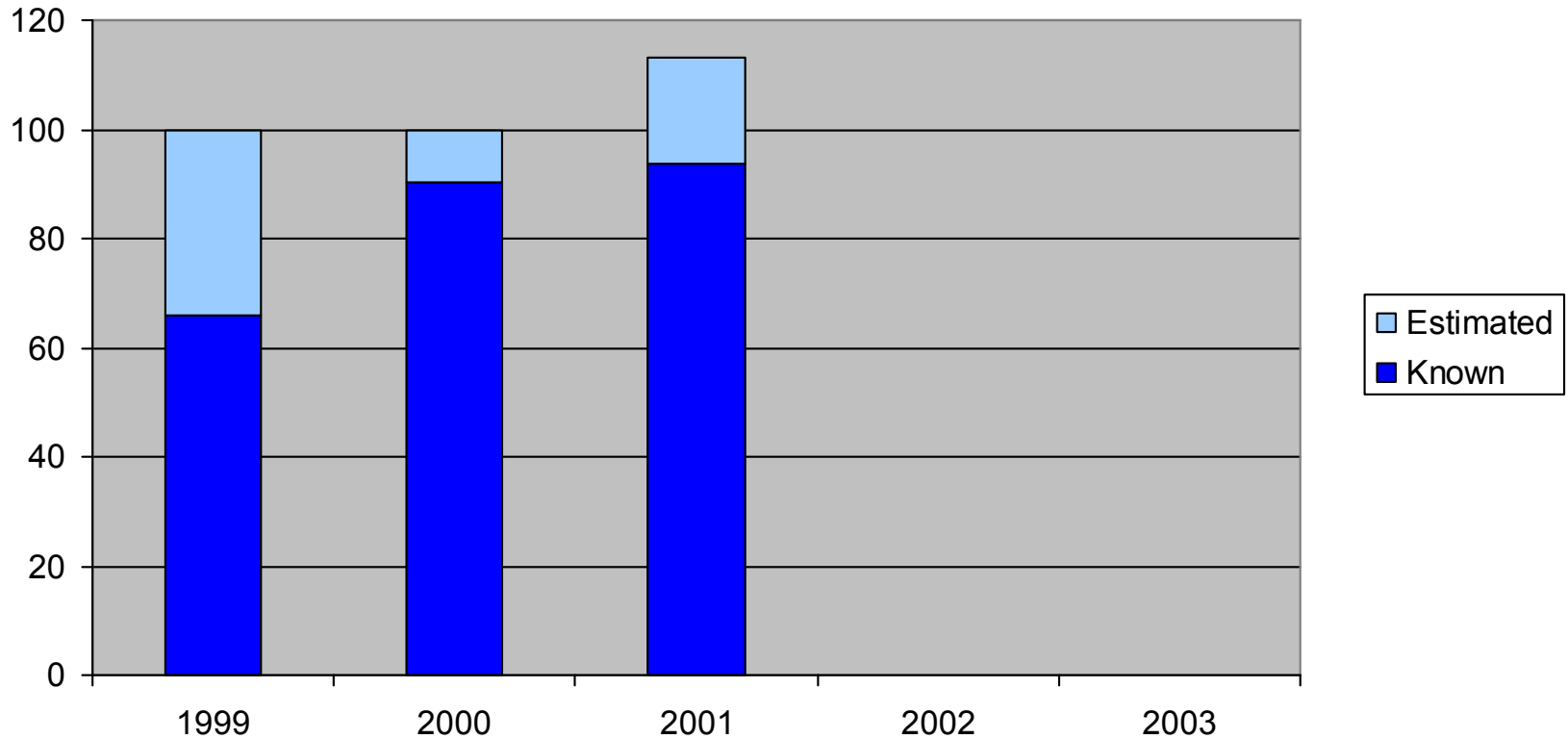 - **Reduces the tail on prior year claims that needs to be estimated**
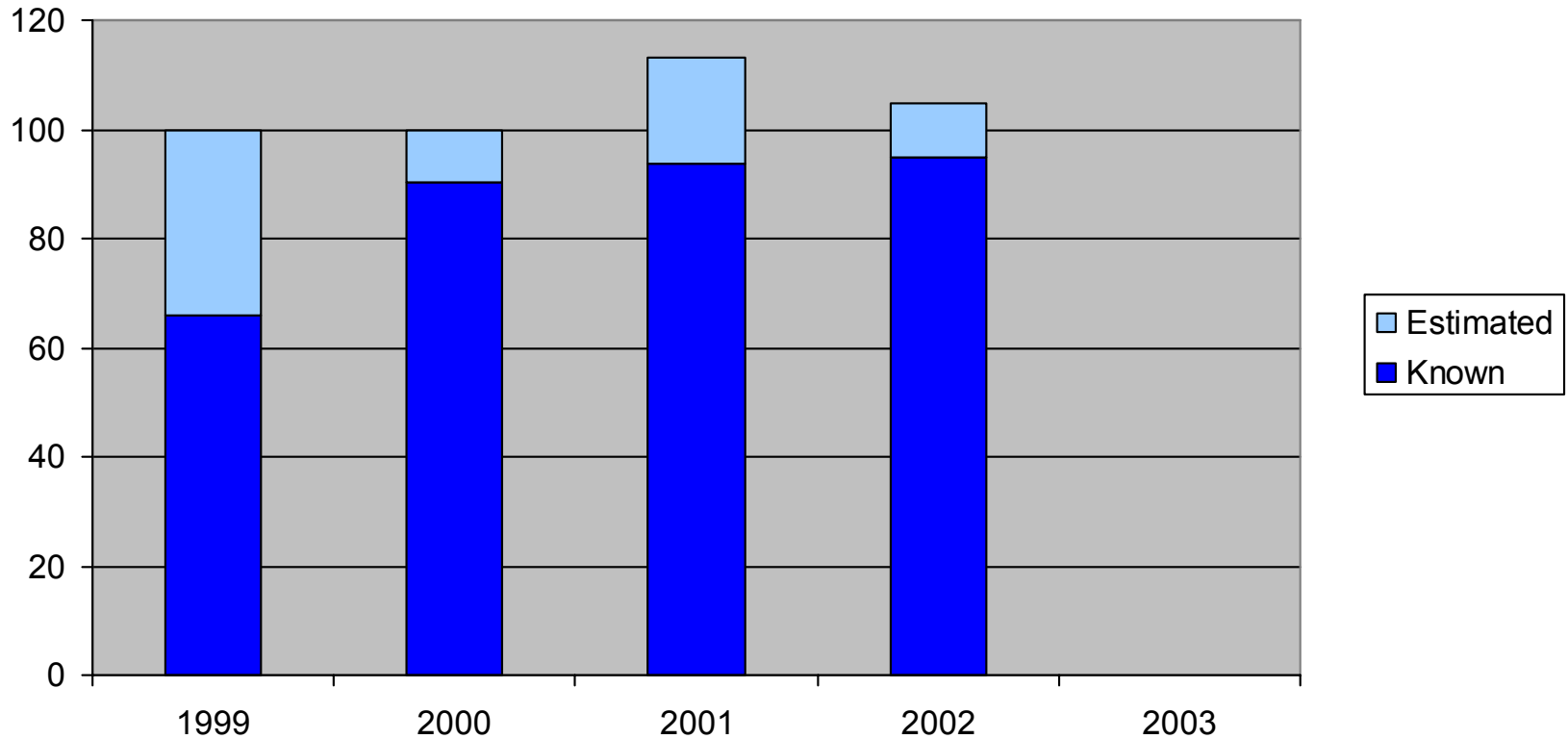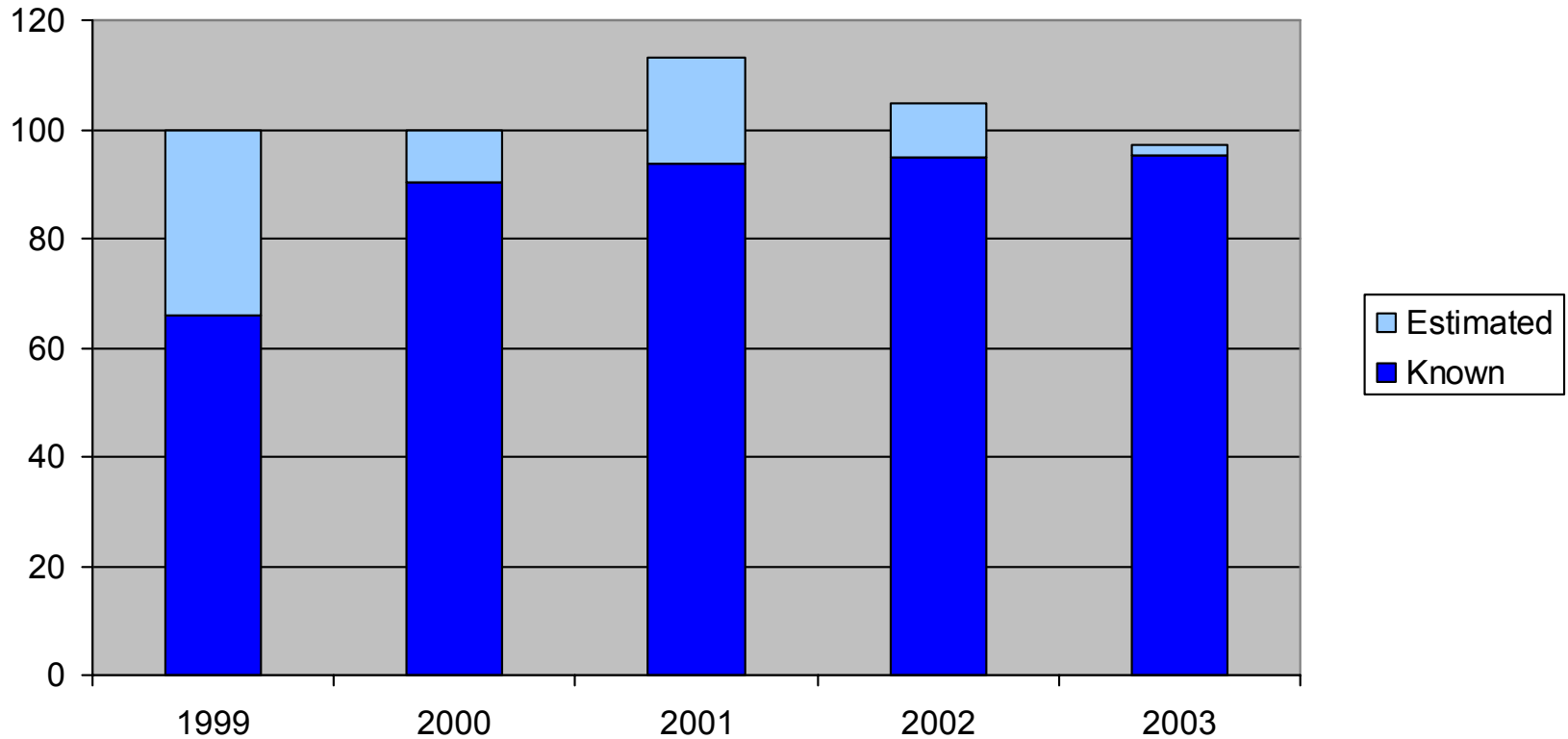
Estimation of claims development for 1999
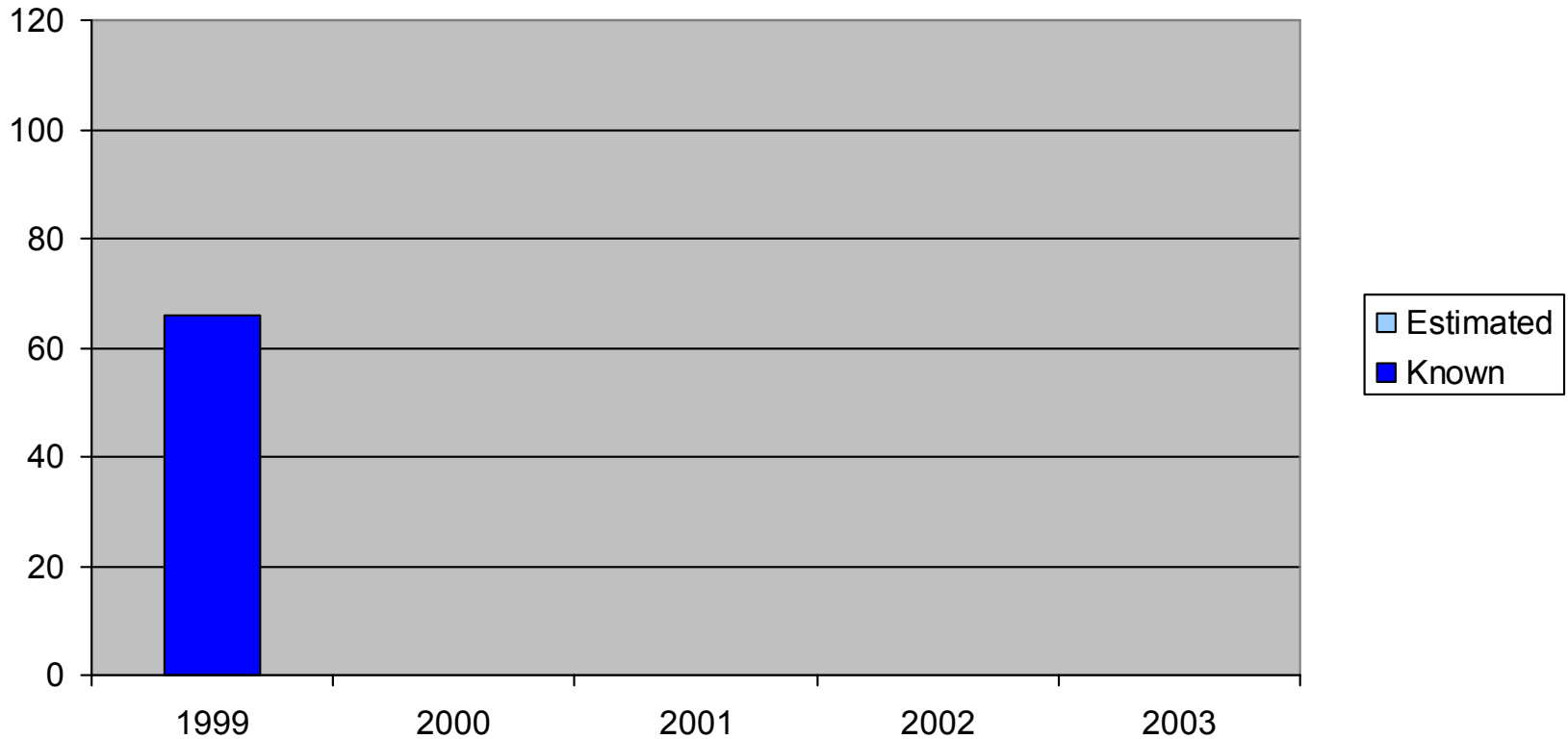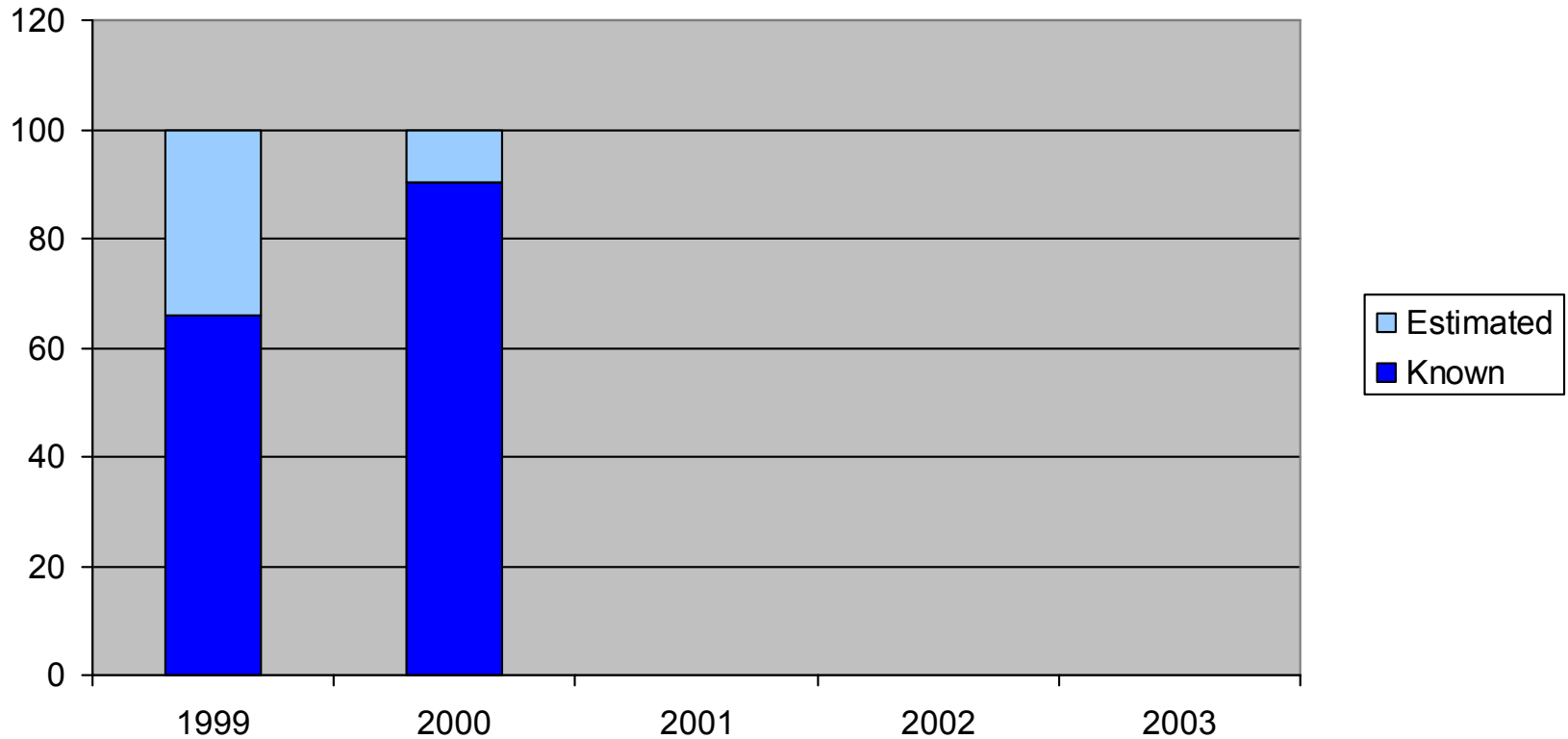
Estimation of claims development for 1999

Estimation of claims development for 1999

Estimation of claims development for 1999

Estimation of claims development for 1999

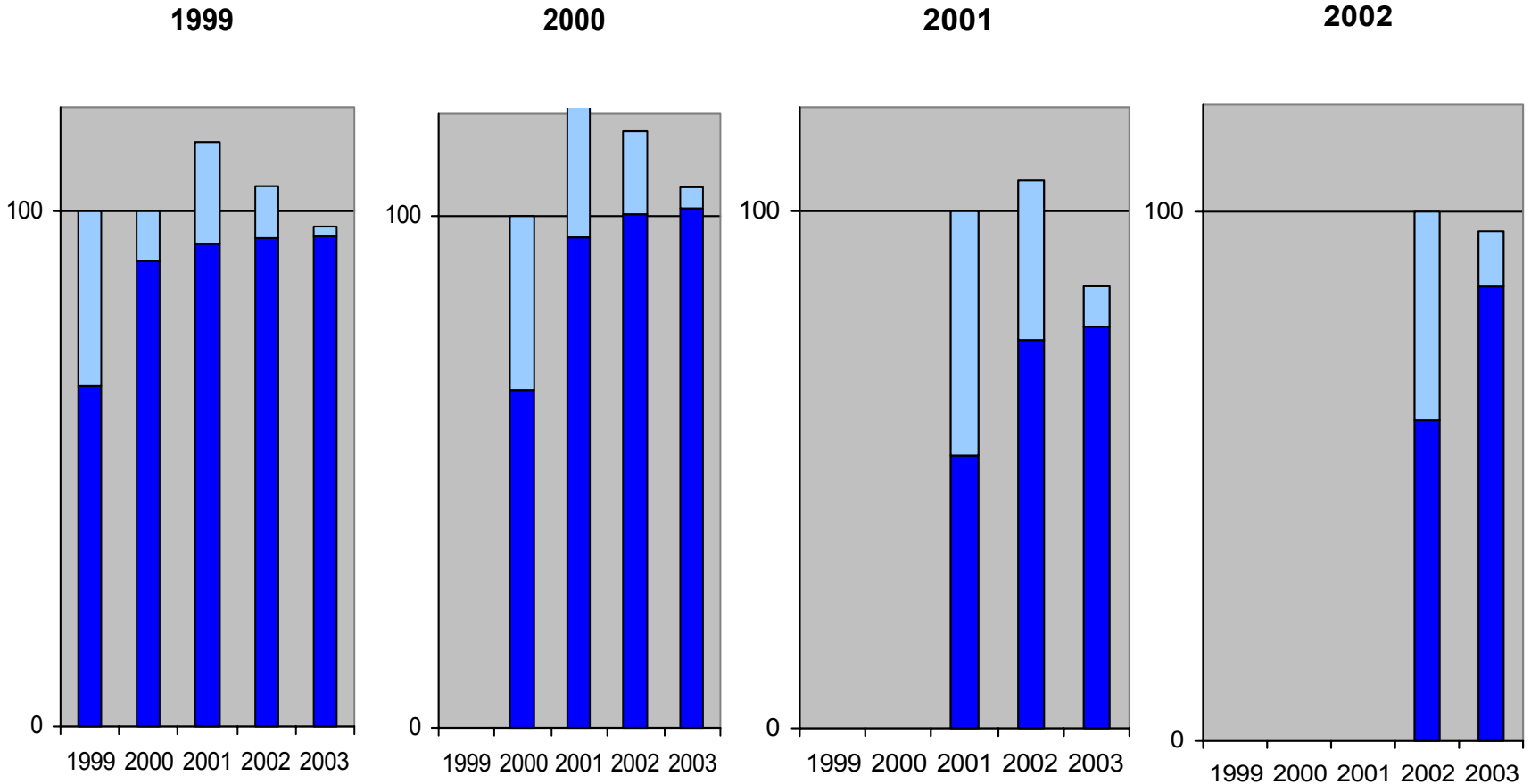# Estimation of claims development

1999

2000

2001

2002

Estimate of fully-developed claims at end of year 0 = 100

Dark blue = Actual claims

Estimation of Grossing-Up Factors

- **Using development patterns derived from data from 1999-2003, overall GUF for 1999-2002 estimated to be 15.9%[1]**

- **But, using development patterns derived from data from 1999-2002, overall GUF for 1999-2002 estimated to be 17.8%**

- **Overall GUF for 2003 estimated using this approach and development patterns derived from data from 1999-2003 is 14.3%**

- **Corresponding GUF for 2004 is just 1.9% due to significant downturn in business volumes**

- ***Are GUFs too unstable?***

- ***Is there a better way?***

[1]15.9% for 1999-2003 is new estimate following correction of the 2003 data error. Previous estimate was 14.8% (quoted at Staple Inn Seminar; Dec 2006)
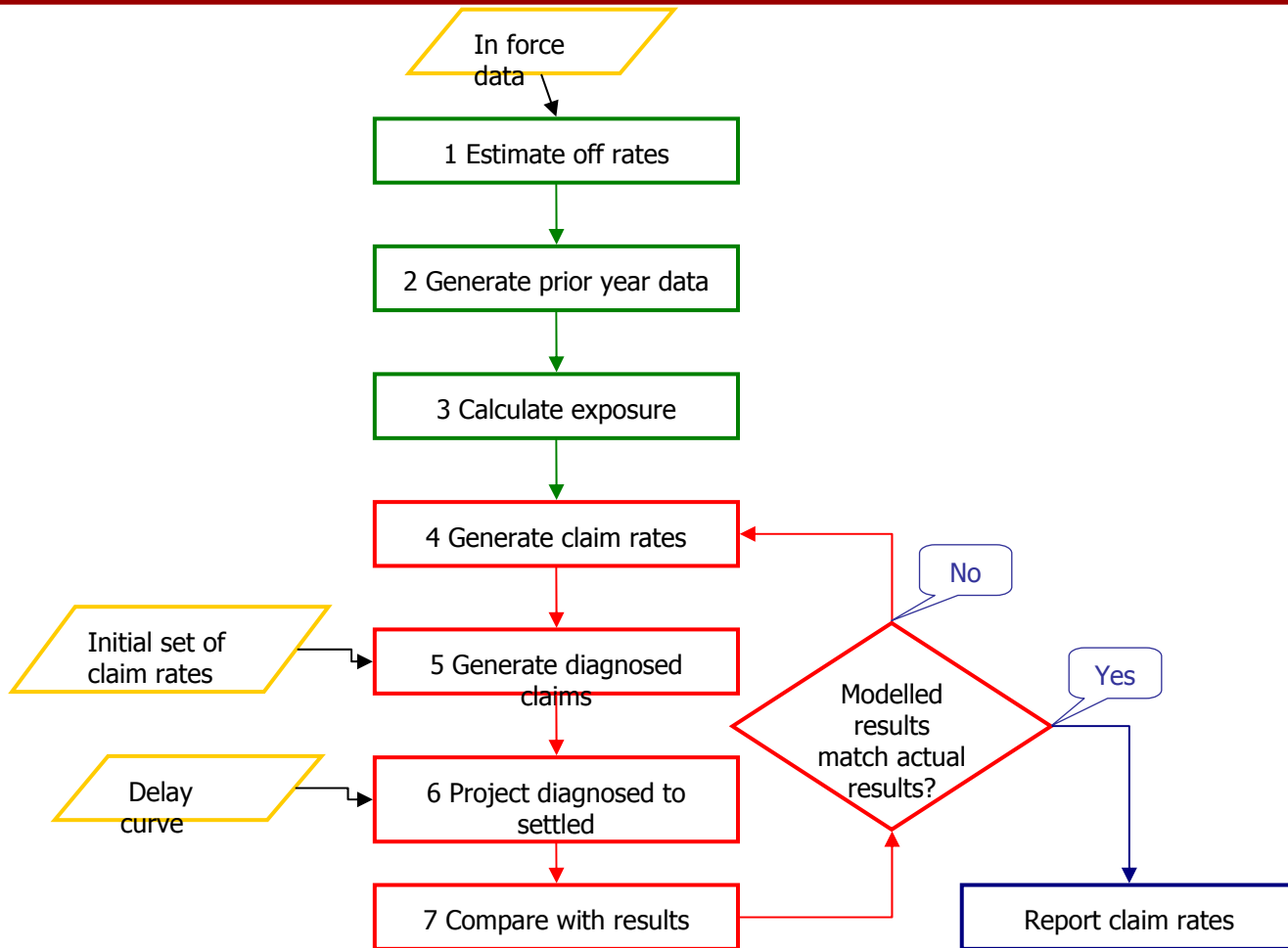
New Methodology

- **The key challenge facing the CI investigation is that we collect settled claims, but want to measure experience in terms of diagnosed claims**

- **grossing-up factors have been used to allow for this**

- **…but we think the new approach makes better use of the data we have**

New Methodology

- The approach starts with estimating prior years' in force data and hence exposure

- … from which we estimate diagnosed claims in each year (at each age and duration) using an initial set of claim rates

- … we then apply a claim delay function to estimate settled claims in each year

- … these can be compared to known settled claims and a revised set of claim rates generated

- … output is a set of diagnosed claim rates

New Methodology

New Methodology

- **Initial tests on male non-smokers are encouraging** (i.e. broadly consistent with expected results)

- **… now embarking on a full-scale implementation**

- **The method does require some assumptions:**
  - progress of In Force 1999-2004 can be used to project back to prior years;
  - underlying claim rates are constant over the period;
  - the claim delay curve has not altered;

- **However the initial tests indicate the results are not overly sensitive to the assumptions**

Agenda

- **Recap of CI Investigation Objectives**

- **Key Challenges and Recent Progress**

- **Results Update**

- **Next Steps**

Position this time last year

- **Released results for 1998, 1999 & 2000 in 2003**

- **Results for 1999, 2000, 2001, 2002 & quad released in May 2005**

- **2003 Results released in April 2006 for the "quad" offices (those who had submitted data at the end of 1999-2002)**

Issues with 2003/4 results

- **2003 results:**
  - data from several "new" offices were not included in original release
  - error in data from one (substantial) office highlighted in 2004 submission

  Error corrected and new offices added

  => "2003 revised" results released

- **2004 results:**
  - Some of the "quad" offices were late delivering 2004 data

  Now received

  => 2004 results released

Results by Calendar Year

Accelerated business, all ages, all durations, Lives (E=CIBT93)

		1999-2002	2003 original	2003 revised	2004
Male	NS	38	31	33	34
	Sm	69	53	57	59
Female	NS	45	40	42	43
	Sm	57	53	58	57

Raw results - no Grossing-Up Factors applied

Results by Duration

Accelerated business, Male Non-smoker only, all ages, Lives (E=CIBT93)

	1999-2002	2003 original	2003 revised	2004
Duration 0	31	27	27	36
Duration 1	37	25	28	37
Duration 2+	41	35	37	32
All Durations	38	31	33	34

Raw results - no Grossing-Up Factors applied

Results by Age

Accelerated business, Male Non-smoker only, all durations, Lives (E=CIBT93)

	1999-2002	2003 original	2003 revised	2004
Up to 30	**50**	**36**	**35**	**47**
31 – 40	**40**	**30**	**30**	**36**
41 – 50	**36**	**32**	**32**	**28**
51 – 60	**35**	**32**	**37**	**36**
61+	**39**	**32**	**37**	**39**
All Ages	**38**	**31**	**33**	**34**

Raw results - no Grossing-Up Factors applied

Agenda

- **Recap of CI Investigation Objectives**

- **Key Challenges and Recent Progress**

- **Results Update**

- **Next Steps**

Next Steps

- **New Methodology**
  - build and test process
  - verify test results
  - extend to historic "raw" results → best estimate diagnosis rates

- **GLM Analysis**
  - complete testing to identify influences/interactions of key risk factors;
  - use results to refine new methodology for deriving diagnosis rates;
  - identify key categories for breaking down results;
  - investigate possible uses for graduation.

- **=> Working Paper by July 2007**

The Actuarial Profession
making financial sense of the future

CMI Critical Illness Investigation

Learning From Experience –
"Practitioner's Perspective

Healthcare Conference: 9-11 May 2007, Manchester

Hamish Wilson

Agenda

- **Practitioner's Perspective**

  - **What do we provide vs what do we get back?**

  - **Key issues life offices need to address**

  - **Opportunities and priorities for improvement**

What do we provide to CMI?

- Annual Per policy data
  - Due by 30 June following year (can be challenging)

  - Includes general policy details and dates, impairment rating and u/w information, amounts and changes over year, commuted amounts for income benefits

- Detailed Claim (Exit) Information:
  - Date and Type of Exit
  - Date of Claim (actual date of death or diagnosis)
  - Dates of notification, admission and settlement of claims
  - Cause of Claim
    - 24 named conditions, other and unknown
    - Cancer site requested (30 options)

What do we get back?

- Analysis of data by CMI coding attributes
  - Territory (UK,ROI), sex, smoker status, benefit type (sngl,J/L), sales channel (BA, IFA, Direct, Other), product type, age (10 yr groupings), duration (1,2,3,4,5+)
  - By lives and sum assured
  - By cause of claim

- Detailed analysis of claims (A/E)
  - By Accelerated and Stand Alone on lives and sum assured
  - Expected against CIBT93 and IC94
  - On lives and Amounts
  - By age and duration
  - By cause, age and duration
  - By Sales Channel

Immediate questions

- Are the input data requirements and timescales reasonable?

- How difficult are they to meet in practice (given other priorities)?

- Are the results detailed enough given the data we provide?

- Are they available early enough to be useful?

- Are the inputs and outputs accurate/reliable?
  - How do we know?

- Do the results allow us to track trends?
  - Consistency of participating offices?
  - Effects of changes in underlying products / business mix?

Key issues life offices need to address

- **Benchmarking against industry experience**

- **Input to pricing and reserving assumptions for current and new products**

- **Evidence to support rate reviews (office and/or reinsurance premiums)**

- **Are we charging (and reserving) appropriately for guarantees?**

- **What are the underlying trends by cause of claim?**

- **Effect of key risk factors: age, gender, S/NS duration, distribution channel?**

- **Impact of changes in claim definitions?**

- **Moving to tiered benefit structures - pricing/reserving impact?**

How much does the CI investigation help with these? Could it do more?

Limitations of CMI results

- Prone to any weaknesses in individual offices' submissions
  - Relying on each office submitting data correctly including correct classification of claims (deaths on SACIC etc)
  - Often carried out by junior staff member new to job each year

- Year-on-year inconsistencies:
  - movements of offices in and out of investigation
  - changes in risk management practice
  - M&A activity
  - changes in individual offices' submission quality

- Too many "other" or "unknown" claims in data

- Claim delays - how reliable are grossing up factors?

- Delays in release of results from CMI

What can offices do to help?

- Obvious answer:
  - Provide all data on time, in format requested and with full details requested (not always possible!)

- Practical suggestions:
  - Take CMI submission as seriously as internal investigation
  - Keep some level of consistency in staff responsible and internal methods
  - Give detailed commentary on each data item submitted (see next slide)
  - Can life office provide a better estimate for missing dates and supply with submission ??
  - Check office only CMI results against internal investigation and report back to CMI if discrepancies

Submission commentary - examples

- **5.23 Rated or non-rated**
- Data Field submitted as CMI Guidelines.
- "N" has been recorded for benefits under the office's standard terms, otherwise "Y" has been recorded.
- This field has been recorded at Policy level, rather than at Lives level, as we are unable to differentiate between lives.

- **5.24 Impairment code**
- Data Field submitted as CMI Guidelines.
- The field has been left blank if the Rated or non-rated field records "N". However, the office does not have sufficient information about the impairment, so "MM" has been recorded

Priorities for CMI

- **Fully developed diagnosis rates**
    - remove confusion/distortion from claim delays
    - consistent restatement of historic results

- **Breakdown by cause of claim**
    - enable separate analysis of underlying trends
    - will aid product development and innovation

- **Other breakdowns by key risk factors**
    - make full use of detail provided in submitted data

- **"Early warning" claims statistics**
    - more detail at very short durations
    - close focus on evidence of anti-selection across industry
    - get results out as early as possible!

- **Projection of trends(?)**
    - Key issue for mortality – why not CI?

Open questions

- Feedback on change in format to per policy submission?

- What else can the CMI provide given the amount of data they collect?

- Are results coming back quickly enough?

- How does CI compare with other CMI investigations?
  - Are there lessons to be learnt from mortality, or vice versa?
  - Do we need a more joined up approach?

- Other Questions ??

CMI Critical Illness Investigation

Learning From Experience

Healthcare Conference: 9-11 May 2007, Manchester

David Heeney

Hamish Wilson