Critical Illness – A global market overview
“A UK perspective”

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Agenda for today

- **Update on UK claims experience**  
  (Source: Dave Grimshaw, “MOT or Cosmetic Surgery”, Staple Inn 6 December 2006)

- **Overview of SIAS paper “Exploring the Critical Path”**  
  (Source: Neil Robjohns, Staple Inn 6 December 2006)
Update on UK claims experience

- “A Critical Review”
- History of the CMI CI investigation
- Key challenges
- Recent progress
- Results
- Future work
“A Critical Review”

- Report of the Critical Illness Healthcare Study Group
- Presented at the Staple Inn March 2000 by Dinani et al
- The first UK CI insured experience study
- Covered 1991-97
History of the CMI CI investigation

• First formed in 2005
• 1999-2002 and quad results released in 2005
• 2003 results and draft 2004 results released in 2006
• Various working papers with methodology etc
  – Working Paper 18 - responses to feedback on WP14
  – Working Paper 19 – “Per-Policy” data submission
• Ultimate aim is to produce a standard table
Key challenges - growing exposure 1999-2003

Update on UK claims experience
Key challenges - immature experience (by age)

Exposure

Claims

Update on UK claims experience
Key challenges – claim dates

- CMI request 4 dates for each claim: Date of Diagnosis, Date of Notification, Date of Admittance & Date of Settlement
- Date of diagnosis matches exposure and matches the risk incurred by the office
- But:
  - The claims we receive are those settled in the period.
  - Offices only supply date of diagnosis for some claims. In other cases we estimate it from the dates we are given:

<table>
<thead>
<tr>
<th>Actual Date of Diagnosis</th>
<th>1999-2002</th>
<th>2003</th>
<th>2004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated from Date of Settlement</td>
<td>42.3%</td>
<td>35.4%</td>
<td>23.5%</td>
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<tr>
<td>Estimated from Date of Admittance</td>
<td>1.2%</td>
<td>0%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Estimated from Date of Notification</td>
<td>0.4%</td>
<td>0.3%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>
Key challenges - date of Diagnosis v Date of Settlement

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

Growth in business affects progress from A to B

Claim development pattern affects progress from B to C

Update on UK claims experience
Key challenges - observed claim delays by cause

Diagnosis to Settlement, 1999-2002 data

- Death
- H Attack
- Cancer
- Stroke
- TPD

Update on UK claims experience
Key challenges – date of diagnosis

- What do we mean by “Date of diagnosis”?  
  - For some events it has a clear meaning (eg heart attack, surgical, death)  
  - For some events it is not clear what is meant by “Date of diagnosis” (eg cancer, MS)  
- Variation between offices and assessors  
- Consultation proposed definition:  
  - The date of diagnosis is the date at which the CI definition was fulfilled  
- Likely to lead to shorter delays as date of diagnosis will be later in many cases  
- Will affect results over time
Recent progress – discussions with the Health Claims Forum

• Can we agree a clear definition of “Date of diagnosis”?

• Can we record “Date of diagnosis” more often?

• Can we record “Date of diagnosis” consistently?
Recent progress – estimation of grossing up factors

- Use claims where date of diagnosis and year of settlement are known to estimate claim development patterns
- Using development patterns derived from 1999-2003 data, overall grossing-up factor estimated to be around 15%
- Using development patterns derived from 1999-2002 data, overall grossing-up factor estimated to be around 18%
- Instability clearly an issue
- Also significant variation if split by gender, age, product type, duration etc
## Results - by calendar year

Accelerated business, all ages, all durations, Lives \((E=\text{CIBT93})\)

<table>
<thead>
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<td></td>
<td>Sm</td>
<td>57</td>
<td>53</td>
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</table>

Raw results - no Grossing-Up Factors applied

2003 results under-stated due to data error
Graph shows 100xA/E for 7 largest data contributors from 1999-2003 original + a large new contributor from 2003-4.

The size of each ball reflects its relative growth – all balls are equal size in 2000, except “new” office which takes base value in 2003.
# Results - by duration

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

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<td>Duration 0</td>
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<td>Duration 2+</td>
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<td>All Durations</td>
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<td>31</td>
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</tr>
</tbody>
</table>

Raw results - no Grossing-Up Factors applied
2003 results under-stated due to data error
Results – issues and learning points

• Consistency of data - data from “new” offices, data not received from “quad” offices
• Likely issue with 2003 results for one substantial office
• Importance of “date of claim”
• Nature of claim delays
• Impact of growth rate on grossing-up factors
• Trends in results may be due to changes in business mix
• Need to consider grossing-up factors before interpreting results
Future work

• 2004 final results and 2003 corrected results
• Further analysis of grossing-up factors
• Use GLM as graduation tool to produce individual age rates (quite a lot of GLM work done to date on raw claim rates)
• Working paper later this year?
“Exploring the Critical Path”

- CI Trends Research Group
- Population trends in CI incidence and mortality
- Insights into trends for insured lives
- CIBT02 and practical applications
- Observations and conclusions
CI trends research group (1)

- Formed in 2001 with aim of examining underlying trends in factors influencing UK insured CI claim rates and from these to assess
  - historic trend in incidence and mortality rates for major CI’s
  - pointers for future trends in standalone CI, mortality and hence accelerated CI
- Examples of focus of work
  - UK trends in cancer, heart attack and stroke (2001)
  - development of CIBT02 (2006)
CI trends research group (2)

- Insured data – CMI CI experience study
  - relevant but limited in volume, age range etc
  - short time series and trends drowned out by noise
- Population data – CI Trends Research Group
  - large volume, full age range etc and long time series
  - clearly need to distil proxy for insured subset
  - combine with knowledge of medical developments to give a platform for understanding past
  - potentially projecting range of future outcomes
Population trends in CI incidence and mortality (1)

Population trends in CI incidence and mortality (2)

Population Trends: Cancer, Males, Incidence & Mortality
Average Change % pa, Ages 40 - 59, over 1971 - 97

Change in Incidence, %pa
-6.0% -4.0% -2.0% 0.0% 2.0% 4.0%

Change in Mortality, %pa
-6.0% -4.0% -2.0% 0.0% 2.0% 4.0%

- Other
- Lung
- Colorectal
- Pancreas & Bladder
- Mouth & Oesophagus
- Prostate
- NHL
- Stomach
- Kidney
- Malignant melanoma
- Testis
Population trends in CI incidence and mortality (3)


**Males**
- Incidence: -2.0%, 0.0%, 2.0%, 4.0%, 6.0%
- Mortality: -8.0%, -6.0%, -4.0%, -2.0%, 0.0%, 2.0%, 4.0%

**Females**
- Incidence: -2.0%, 0.0%, 2.0%, 4.0%, 6.0%
- Mortality: -8.0%, -6.0%, -4.0%, -2.0%, 0.0%, 2.0%, 4.0%
Population trends in CI incidence and mortality (4)

Population Trends: Summary, by Type of Cover Overall Change, by broad age-groups, 1989-2003

Average Change 1989 - 2003, %pa

-3.0%  -2.5%  -2.0%  -1.5%  -1.0%  -0.5%  0.0%  0.5%  1.0%  1.5%

Stand-alone CI Accelerated CI Mortality

Males, 20-39 Orange Males, 40-59 Brown Males 60+ Yellow
Females, 20-39 Cyan Females, 40-59 Blue Females, 60+ Magenta
Population trends in CI incidence and mortality (5)

Sub-population Trends: England v Scotland
Incidence & Mortality, Heart Attack, Males, Ages 40-59, 89-03
CIBT02 & practical applications – an update to CIBT93

- Absence of an insured lives table
- Emergence of new and better data for producing population CI table
- New table allows updates on shape by age, breakdown of total incidence by cause etc
- Successes (eg better quality data and information for adjustments)
- Some problems (eg inconsistencies, TPD)
- Caveats (uncertainty in adjustments and reconciliations to insured experience)
CIBT02 & practical applications – derivation of CIBT02

• Derive crude rates from incidence count and population data
• Adjust to ‘first ever’ incidence
• Gross-up for missing ‘sudden deaths’
• Remove overlap with other CI’s
• Adjust for prevalence to ‘healthy population’ rate
• Graduate resulting pure CI incidence rate I
• Remove deaths in survival period to calculate standalone CI rate I’
• Calculate mortality rate for CI = kq
• Derive accelerated CI rate as I + (1-k)q
CIBT02 & practical applications – CIBT02 coverage

• CIBT02 Core matches CIBT93 coverage
  – Cancer, heart attack, stroke, CABG, MS, KF, MOT and TPD
  – Standalone and accelerated
• CIBT02 Extended adds other commonly covered CI’s
  – ABI SOBP definitions and angioplasty
  – Terminal illness for accelerated CI only
CIBT02 & practical applications

Contribution of each CI - Males CIBT02 Core Stand-Alone Rates (I') (excl TPD)
CIBT02 & practical applications

Contribution of each CI - Females CIBT02 Core Stand-Alone Rates (I') (excl TPD)
CIBT02 & practical applications

Raw Trend and Overall Change - StrokeIncidence (I), Stand-Alone (I'), and Mortality Rates
Crude CMI CI Experience using CIBT93 & CIBT02 By Critical Illness, for Males

<table>
<thead>
<tr>
<th></th>
<th>CIBT93</th>
<th>CIBT02C</th>
<th>CIBT02E</th>
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<tbody>
<tr>
<td>C</td>
<td>55</td>
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<td>HA</td>
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<td>Stroke</td>
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<td>CABG</td>
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<td>MS</td>
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<td>Other</td>
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<td>TPD</td>
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<td>Death</td>
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<tr>
<td>All</td>
<td>44</td>
<td>43</td>
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</tbody>
</table>
Relative CI Rates by Deprivation Category Scotland, 1989 – 93, Ages 40 – 59, Males

Incidence

Mortality

Heart  Stroke  Cancer  Lung C  Prostate C

Cat 1  Cat 2  Cat 3  Cat 4  Cat 5  Cat 6  Cat 7
CIBT02 & practical applications – observations & conclusions

- Trend in raw incidence of major Cl’s at population level is gently upwards (particularly for cancer)
- Trends for insured subset likely to be worse
  - dominance of cancer
  - removal of benefit of falling smoker prevalence
  - possible narrowing of socio-economic differences
- CIBT02 fits CMI CI experience a little better than CIBT93
- Raw CMI CI experience needs significant grossing up
- CIBT02 tables should be useful benchmark
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